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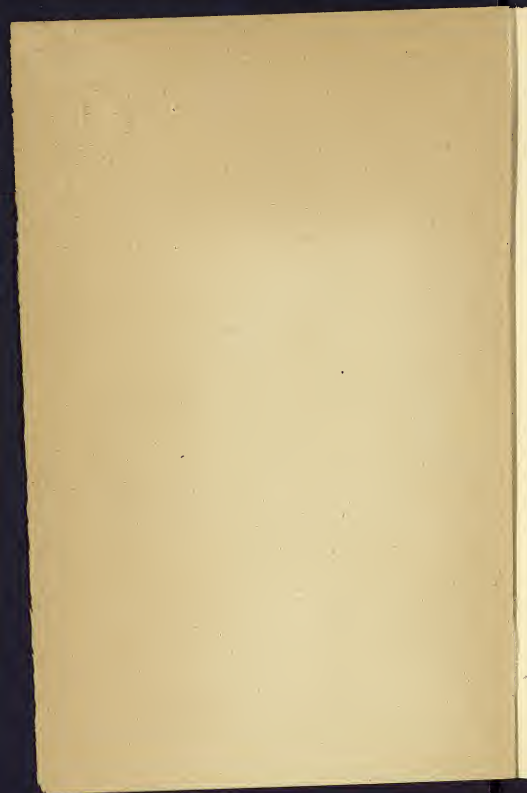
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CATTLE REARING.

BY
ARTHUR ROLAND.

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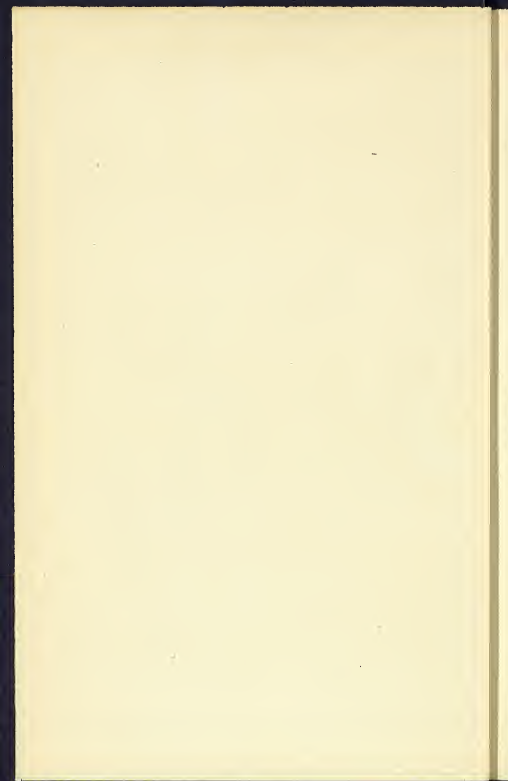
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STOCK KEEPING AND CATTLE
REARING.



STOCK KEEPING AND CATTLE REARING.

CHAPTER I.

PIGS.

The General Aspect of Pig-keeping—Pig-keeping in Private Families—Various Breeds of Pigs—The Irish Breed—The Rudgewick Breed—The Hampshire Hog—The Chinese Pig—Mediterranean Breeds—The Small Breeds—The Dishleys—The Suffolk and Norfolk Breeds—The Shropshire Breed—The Cheshire Pig—The Old Lincolnshire or Yorkshire Pig—The Improved Lincolnshire Pig—The Gloucestershire Breed—The Improved Essex Breed—Essex Half-blacks—The Berkshire Breed—Descriptive Terms of Pigs.

The General Aspect of Pig-keeping.—I generally keep about forty pigs, large and small, on hand, this branch of stock-keeping always having answered my purpose uncommonly well.

Many farmers in my neighbourhood say they cannot make pigs pay, for, though a few are kept to eat up the waste food of various kinds, that otherwise would become lost, or next door to thrown away—as small potatoes, tail-wheat, and the various refuse in one shape or another about a farm—they are unable to manage them profitably when they have such numbers that they are obliged to purchase food for

them, or, what amounts to the same thing, feed them with their own produce at market prices.

Now, I have resorted to various economical contrivances for feeding my pigs, which many farmers entirely overlook, and some of these sell me their diseased potatoes at 6*d.* per bushel, or 3*d.* if they are very bad, which I purchase to give to my pigs, but which they, doubtless, do not consider sufficiently good for theirs; yet for health, and general condition, my stock of all kinds will compare favourably with that of any of my neighbours.

Some of the potatoes at 3*d.* per bushel, as may be supposed, are very bad, being wet and sticky, and smelling disagreeably. Many farmers boil these up for their pigs, and tread them down in a pit with salt—a good enough way, for, though they get sour, the pigs will eat them readily enough. But I adopt another plan, and have built a small kiln, and over a fire-hole a thick iron plate is laid. Upon this plate the potatoes are spread thinly out, and are *nicely baked*, the heat drying up the objectionable moisture by this method, and, when properly cooked, they are baked potatoes of the ordinary description, and the pigs will eat them as readily as they will corn.

By these and similar contrivances, which I shall afterwards describe, I manage to get a good deal of food together for these hearty eaters, which would cost me a large sum to feed, if I simply went to the miller's and bought food for them, in the way that many persons do, as a matter of course.

I make these few remarks just to strike the keynote of the subject, as it were, to point out in which direction the profits of pig-keeping are to be found;

but some breeds of pigs do better upon rough fare than others, and on this score I always keep the Berkshire. They are hardy, and will do very well upon coarse food till the time comes to fatten them. They are fairly prolific, and are suitable to make either pork or bacon of, having a large proportion of lean flesh, which causes them to be well adapted for bacon-pigs. Other breeds may fatten as rapidly, but few cut up so well. They also stand changes in the weather better than any other breed of pig with which I am acquainted.

Many turn their pigs out to graze, and breeding sows, doubtless, do well when so treated; but I always keep mine in their styes, and we make large quantities of manure from them, which we find highly advantageous. In short, it is our sheet anchor for my five acres of hops, combined with the other manure we scrape together, of which fallen leaves in autumn, that we use first as litter in the pig-styes, make no inconsiderable proportion. In fact, the pig-styes are constant manufactories of manure for us. The cuttings of the grass-plots, the "singlings" of turnips and mangolds; the potato-tops from the garden or the field-patch; the trimmings of the hedges, all are thrown down in a heap *outside* the pig-styes, and a portion of the heap tossed over several times in the course of the day.

The men, if left to themselves, would bundle these all over at one time, very often, so that the pigs would pick over, and eat a portion of it while fresh, but soon trample down the remainder, and spoil it. By tossing a portion over to them at frequent intervals during the day, they eat a great deal of what is thus given

to them, and the stalks and rough portions are converted into manure by their hoofs.

Nettles grow in great profusion in our hedges, the somewhat sandy soil which chiefly prevails, apparently being favourable to their growth. These I have all cut down with a bill-hook by one of the men, and they are brought to the pig-styes—unless we boil some up with other green stuff, which we do when they are young—and the pigs eat the nettles as freely as they will cabbages.

My economical contrivances in this way, as may be expected, provoked the scorn of the labourers at first, and does at all times upon the occasion of a new man being engaged; but the success of the plan has been proved to demonstration, over and over again, to my old hands, who have got into my ways, and system, and it is upon the adoption of these economical contrivances that the profits of farming mainly depend. This rough food, supplemented by a small quantity of good, nutritious victuals, enables a number of pigs to be kept, which, if expensively fed, would be out of the question.

The advice generally given to pig-breeders—and which is of a sound character—is generally somewhat after this wise. In deciding upon the breed of pig that it is advisable to keep, the wants and prejudices of the locality must be taken into account, if the pigs are to be sold as store-pigs. In some neighbourhoods black pigs are disliked, from an idea that the flesh is not so white and delicate. Again, where black pigs are in favour, white are not liked, not being considered so hardy. If pigs are wanted for pork, those which lay on fat quickly and come easily to maturity—

which is the case with some of the smaller breeds—will cause them to be desirable. On the other hand, if large bacon-hogs are required, the meat of which is chiefly consumed by a working population, some of the large breeds will be found the most advantageous to keep. But if the demand is about equal for bacon and pork, then the medium-sized breeds are the best to have; and the latter instance fits my case, and the Berkshire breed consequently suits me better than any other, and I think, on the whole, will be found to answer the purpose of most people on a farm where there is a mixed produce, and a good lot of rough food to be eaten up.

Dairy-farmers who do not rear calves upon skimmed-milk, and consequently have a large supply of this excellent food to use for the rearing of stock, will find it more to their advantage to have a small, fine breed, which fattens quickly and commands a ready sale as porkers, and the characteristics of all the leading breeds I will briefly describe.

Small breeds of pigs may be fattened from their birth, and are frequently killed at the age of twenty weeks, to six months old. My experience with the breed I have is, that pigs do not pay to keep as store-pigs, between the ages of two months, and ten, or twelve months old. After two months, when they have been weaned, I always sell them off, and the price we expect to get for each is £1; but at times, when pigs are at a discount, and fetching only very low rates, they will, perhaps, only realise fifteen shillings per head.

If, however, plenty of rough food can be scraped together for them, in the shape of young breeding

sows, they will pay to keep, as they make a quantity of manure, but this will depend very much upon the time of year. Litters cannot always be managed to be dropped at the precise time they are wanted, but as nearly as it can be managed, they should be made to fall when the weather is not extreme, neither too hot nor too cold, avoiding as much as possible Midsummer, and Christmas.

The best periods for litters of pigs to be dropped, will be about the middle of July and February. The first will come in for winter pork, and so suit the requirements of the market, or, as store-pigs, may be economically kept through the months of September, October, and November, upon the refuse of green crops, such as small potatoes, carrots, mis-shapen parsnips, the tops of potatoes, cabbages, mangold, turnips, and a lot of green stuff that can be boiled up for them, supplemented by a small supply of better food.

The spring litter, dropped in February, will have two months' good feeding with the sow, bringing them into April, they will then find a market as young store-pigs, or may be kept for bacon for the following season.

Pigs kept on a gentleman's farm, without proper discrimination being used as to the most appropriate breeds to answer a specific purpose, with a definite object in view, upon the "happy-go-lucky" system, which is, unfortunately, too often practised, will not be found to answer, when left to the unsuperintended care of men, who run to the miller, or corn-chandler, for the supply of the daily wants of these hearty eaters. Heavy bills will thus be incurred, that will soon show pig-keeping to be an unprofitable branch

of a pleasure-farm ; but, under a clear, defined, and definite system of good management, pigs may be made valuable stock, supplying the house with abundance of pork, and bacon, all the year round ; bringing in solid cash from the sales of surplus stock, and furnishing a large amount of valuable manure, that is of the greatest assistance as a fertilizer in the general business of the farm.

Pig-keeping in Private Families.—Pig-keeping upon a small scale, ought always to be profitable in private families. The wash, and refuse of the kitchen, if put aside and given to the pig, would be enough to keep it, supplemented by a little extra food now and then, in the shape of pollard. All the waste stuff of the kitchen-garden should find its way to the pig-stye. The mowings of lawns, potato-tops, the pea-shells, and various odds and ends which are often objectionable in the precincts of a private house, and in the form of decaying cabbage-stumps or broccoli-stalks are a positive nuisance, emitting a most offensive effluvia when merely thrown upon the dunghill, situated, perhaps, at the end of the garden, and tainting the air, are all conveniently disposed of in this way, and what the pig does not eat its hoofs will convert into manure.

Pig-manure is sometimes considered objectionable in gardens in consequence of its proneness to breed maggots, &c., but this may be remedied by the admixture of a little quicklime with it, and if buried pretty often, which the quick succession of crops in a garden will enable to be done readily, there ought not to be any objectionable smells of any consequence.

A breeding sow will be found the most profitable, and a store-pig may now and then be left for fatten-

ing, but if a store-pig only is wanted to be turned into bacon, a few bushels of barley-meal given to it before it is killed, will make it fat, and ready for the butcher. The best method of doing this will be found under the heading of "Feeding."

Various Breeds of Pigs.—Perhaps there is no species of animals in which there is so wide a diversity to be found as in that of swine, and the improvements that have been effected of late years in some of the breeds, have been very marked. Some of the best bacon that is sent to the London market is cured in Ireland, but the animals now fed in the sister kingdom are certainly not the old Irish breed, the original stock having been improved by crossing with the Berkshire, improved Suffolks, and other favourite English breeds.

The Irish Breed.—The true Irish pig is an ill-formed animal which, although in days gone by used to live in the same hut, and share the fare of his master, was always large and coarse. Parkinson says, in speaking of the Irish breed, that it is not uncommon for the poorer sort of men to be two years in fattening a pig, describing the animal as being of the size of a large jackass, and very large boned. As the Irishman's pig has always been accredited with paying the "rint," unless Pat was in the habit of paying his rent once in every two years, at the time at which Parkinson wrote, we can scarcely reconcile this statement with the proper facts of the case. As a breed for stock purposes, it does not deserve notice, being very long, narrow in frame, mis-shapen, with large hanging ears, and strong, bristly hair; yet it will serve to point a contrast between the true Highland breed

and itself, the latter being an ugly brindled monster, resembling in appearance the wild boar, yet scarcely larger than an English terrier dog.

The Rudgewick Breed.—One of the largest English breeds, which for ages were reared on the borders of Surrey, and Sussex, but which do not appear to have extended much beyond those counties, is the Rudgewick breed. These have attained such an enormous size as to reach the weight of an ox, and one is recorded to have attained the unparalleled weight of 182 stones when three years old. In the *Middlesex Report*, and *Melcom's Surrey, Kent, and Sussex*, instances are recorded of animals of this breed having been fed at two years, by different persons, to the weights respectively of 116 stones, 99 stones, 97 stones, 93 stones, and 91 stones.

The Hampshire Hog.—The Hampshire hog has long borne a good name for making superior bacon. The breed is now seldom to be met with, having been crossed a good deal with Berkshires, Suffolk, the Chinese, and other breeds; and it is very questionable if the true Hampshire ever deserved the high reputation it won on its own account, being a coarse, raw-boned, flat-sided animal, whose only merit consisted in fattening quickly, and doing justice to the food with which it was supplied.

Its reputed excellence is doubtless to be attributed to the facts of its being fed when young upon the mast which abounds in the New Forest, and to an excellent method of curing followed in Hampshire. The true breed is of a white colour, and not by any means of a large size, the specimens when fattened, seldom exceeding eighteen, and rarely reaching to

twenty score weight, according to *Vancouver's Hampshire*.

As, however, the original breed is now seldom to be met with, this fact furnishes the best proof possible, that pig breeders of the county were aware of the shortcomings of the native stock, in seeking to improve it by judicious crossing, which they have done so effectually, that the true Hampshire hog is rarely to be seen.

The Chinese Pig.—The influence of the Chinese pig by its cross with the larger breeds of this country, has been very marked, for although the occasion of diminishing the size, and weight of many original breeds, it unquestionably has been the means of producing several kinds possessing properties superior to those of the parent stock, and it is generally assumed that, to the Chinese, Maltese, Neapolitan, and other breeds introduced from the shores of the Mediterranean, we are principally indebted for the improvement of the old English pig; while, on the other hand, the cross with the latter has given the former lean flesh, the great fault of the Chinese breed being the almost total absence of lean flesh.

This breed has been sub-divided into about seven varieties, but there are two distinct species, the white and the black, the white being better shaped than the black, but less hardy and prolific.

The black breed will fatten upon a comparatively small quantity of food, and an instance is recorded in *Bewick's Quadrupeds* of a sow that had one litter of nineteen pigs, that being the third time of farrowing within fourteen months, in which period she produced no less than fifty young!

The best breeds of the Chinese white, are remarkable for thinness of skin, the hair sparsely set with only a few fine bristles, both skin and hair being very white. The head is short, and its eyes bright and fiery, the snout being rather broad, small prick-ears, wide cheek, high chine, and an enormous neck, which seems to belong to, and form part of the carcass, being without shape, or symmetry. Its legs are remarkably short, the belly nearly touching the ground, while it has a disproportionately short tail also.

When fed upon meal, and corn, the flesh is delicate, if not made too fat, but if oily substances, or animal matter are used in feeding, the flesh itself becomes fat of an oily nature, that is coarse, and unpleasant; the accumulation of fat and absence of lean flesh being a marked peculiarity of this breed.

If allowed to run about, and not fed too highly, they make good porkers, but their flesh is too tender for bacon, having too much fat, while their hind quarters are so deficient in size, in proportion to their other parts, that they cut up to great disadvantage for hams. They are so much smaller than many other breeds, seldom reaching a greater weight than 16, or 18 stones at two years old, that the object of rearing them to mature age is profitless, their value consisting in their great aptitude to fatten, and the delicacy of the meat when young, which causes them to be an excellent breed for dairymen who rear small porkers. The white, though prolific breeders, are bad mothers.

The largest black breed of the Chinese varieties are more shapely, and will attain a great weight when well fed, in rare instances reaching to 35, and

even 40 stones, an unusual weight for this breed of pig.

The black and white Chinese are not so well shaped, being somewhat ill-formed, and coarse, but they are good breeders and nurses. The small white breed are pigs in miniature, and perfect in make and quality, measuring from the crown, to where the tail is set on, about two feet, and weighing when full grown, and fat, at two years old, only 6 stones. There is also a black variety of somewhat larger size and weight when fat, but similar in shape and of handsome form. There are also the sandy, copper-coloured, or blue Chinese, but all the various breeds possess similar characteristics, the general appearance being very much alike, the principal differences being those of colour, and size.

Mediterranean Breeds.—The Mediterranean breeds before alluded to, as the Neapolitan, Maltese, &c., have also exercised a very useful influence in causing improvements to our breeds of pigs, particularly those of the black varieties. Their forms are well shaped and rounded, both breeds being very similar, and plump and symmetrical; the bones fine, with rather a longer head, but shorter body than the Chinese, and altogether somewhat larger; snout fine, and the body almost without hair or bristles, and quite black in colour. They make good mothers, are tolerably prolific, and will thrive well on only moderate food; their aptitude to fatten at an early age, causing them to be a good breed for those who do not wish to keep store-pigs, and have not a market for young pigs when they want to sell them off quickly, and so have to produce pork; the flavour of their meat being very superior.

The Small Breeds.—There are several small breeds of pigs, that are sometimes termed “little porkers,” “Tunkey” pigs, &c., the latter name having been thought to be most likely a corruption of Tonquin. These, as their name implies, are small in size, but fatten early, and their flesh is remarkably delicate. They are mostly white in colour, thick and compact in shape, with short legs, fine boned, with a thick neck, ears small, but drooping, and very hardy. Of course, for bacon-pigs, they are out of the question. There is no doubt the “Tonkey” or Tonquin pig sprung from a cross between the small Chinese pig and the Berkshire.

The Dishleys.—The Dishleys, though now classed as a distinct breed, are also supposed to be derived from crosses of the Chinese and Berkshire breeds. They are fine boned, and of handsome proportions, and are said to lay on a larger proportion of meat to bone and offal than any other breed. When they are fat, they are nearly the same in length, height, and thickness, their eyes scarcely to be seen in their head for fat, their bellies nearly touching the ground. To these good qualities must be opposed the bad ones, which are somewhat numerous. They are not very prolific; the sows do not make good nurses; they grow but slowly; and are of a somewhat delicate, and tender constitution; and they consume more food in fattening than many of the larger breeds.

A Dishley boar may, however, often be used with advantage for improving another breed, and will confer a roundness of frame upon the progeny, coupled with a proportionate depth of body. Coarse, long-legged breeds, by such a cross would have their legs

shortened, a finer bone produced, with a better appearance in shape and style as store-pigs, with a disposition to feed better when put up in the sty for fattening.

The Suffolk and Norfolk Breeds.—The Suffolk and Norfolk breeds are only of moderate size, but they are very well liked by many people, on account of their being a hardy, and prolific species. They can, however, be very much improved by being crossed with the Berkshire, the progeny so produced being animals possessing capital points. The Suffolk and Norfolk breed fatten quickly, but their shape is against them, and on this account handsomer pigs of a different breed are often preferred to them.

The Shropshire Breed.—The Shropshire is one of the largest breeds we have, and used at one time to be greatly in favour, when fat bacon was consumed in large quantities in farm houses. These used to be commonly fed to thirty score weight, much greater weights occurring occasionally. Some writers have compared this breed with the Hampshire, but it is a much larger animal, and while the size of the Hampshire has been increased by crossing with larger pigs, that of the Shropshire has been diminished by being coupled with Berkshire.

The Cheshire Pig.—In former years the old breed of Cheshire pigs used to attain an immense size, but not in the form that is now recognised as a good shape for a pig. They were long in the body, which was balanced upon four long, bony legs, the body terminating with a large head, and long hanging ears, the back being much curved, and narrow, and the sides flat and deep. The old Cheshires would exceed

four feet in height, and individual instances have been recorded of pigs, when killed and dressed, weighing 10 cwt.

The old Lincolnshire, or Yorkshire Pig.—This breed used to be one of the largest to be found anywhere in the kingdom, possessing but few really good points, being long-legged, and weak-loined, with long coarse, curly hair, of great length from head to tail, and yielding coarse, flabby meat, of very inferior quality.

The improved breed, now recognised as the Yorkshire, or Lincolnshire pig, by judicious crossing, has undergone a very favourable change, and is now considered one of the most useful and profitable breeds we have. Its former ill-proportioned body has been changed into that of a broad-backed animal, with wide, well-set rump, broad chine and loin, with springing ribs, deep sides, and full chest, the head of fair length, with drooping ears, but not too large, the colour being white.

The best specimens of this breed grow very fast, and feed so rapidly that, by good management and liberal feeding, they may be made to attain a weight of from 20, to 25 stones at twelve months old, the meat being of a good quality, and having a fair proportion of lean flesh.

In some of the instances I have enumerated, large pigs in height and size, but mis-shapen in form, have become vastly improved by judicious crossing, and though reduced from their original proportions as a whole, have been increased in those parts in which they previously showed the greatest deficiency.

The Improved Lincolnshire Pig.—Besides the large

breed, or wold pig; Lincolnshire has another variety in a small, and pointed, or prick-eared pig. The large-sized pig abounds in the Lincolnshire wolds, and through a great part of Yorkshire, taking at times irrespectively the names of each county, as well as in those counties which approach the northern boundaries of Lincolnshire. This small breed, however, is mostly found in the southern portions of Lincolnshire, and the counties which border upon it, as Northamptonshire, Leicestershire, Cambridgeshire, and Huntingdonshire, where a smaller breed of pigs is mostly in favour. The small breed, or prick-eared breed, enjoys a high repute in most of the Midland counties. But though nominally called "the small breed," breeders, by skilful crossing, have succeeded in getting the thick, compact, broad-chested, well-shaped figure of some of the smaller breeds, upon the large frame of inferior breeds destitute of these qualities, with the corresponding advantages of arriving at maturity early, and superior quality of flesh, combined with increased size. This has been carried on so well that, it is stated that judges, at agricultural shows, and meetings, are frequently at a loss to distinguish between the large, and small breeds, into which two classes pigs are usually divided for competition, so that each may stand upon their proper merits.

The Gloucestershire Breed.—The colour of this breed is mostly white, and the animal is large in size; a long, tall, ill-formed pig, remarkable for having two wattles hanging from its throat, and not altogether of a very desirable order.

The Improved Essex Pig. Essex half-blacks.—The original Essex breed of pigs were sharp-headed, with

carcases flat and long and generally high upon the leg, mostly white in colour, or mixed black and white, nearly destitute of hair, unquiet of disposition, and great consumers of provender, though quick feeders. By crossing with black Neapolitan, and black Chinese, the breed has become greatly improved, so that upon occasions they have taken equal rank with Berkshire.

The Essex half-blacks were first brought into notice by the late Lord Western, and are considered a very superior breed. They are black and white, with short hair, and smaller heads and ears than the Berkshire; the latter feathered with inside hair, fine skins, very fine bone, full in the hind-quarters, broad and deep in the belly, growing fast, and feeding remarkably quick. It is supposed that these have been derived from descendants of Essex, and Berkshire pigs, crossed again with some kind of Chinese breed. The crosses from this breed are indeed so numerous that it is hardly possible to trace its influence upon many *improved* breeds of pigs, which now chiefly owe their renown, and excellence to this strain, though often vaunted in certain districts as being peculiarly their own.

There are a few other breeds, such as the Herefordshire, and Wiltshire, that do not call for any special notice, and the list may fairly be brought to a conclusion with a description of the Berkshire.

The Berkshire Breed.—The true Berkshire hog is of a reddish brown colour, with black spots, the head well balanced, with ears generally standing forward, though sometimes hanging over the eyes. He is short legged, and small boned, with a rough, curly coat, that by its

appearance would seem to indicate both coarse skin and flesh. This, however, is far from being the case, no pigs making finer bacon. They can be made to attain a very large size, 100 stone having occasionally been reached, though from 40 to 50 stone, when fattened, is the more general average.

The improved breeds of Berkshire are, however, mostly either black or white, and their disposition to fatten quickly is more pronounced than that of the old breed, which Loudan remarks possesses the aptitude to fatten; in his description of them, describing the breed as follows:—"They are generally of a tawny, white, or reddish colour, spotted with black, large ears hanging over the eyes, thick, close and well made in body, legs short, small in the bone, having a disposition to fatten quickly, and, where well fed, the flesh is fine; feeds to a great weight, and is good for either pork or bacon."

Such were the main attributes of the original stock, and the improved breeds doubtless owe their further excellence in the case of the black, to a cross with the Neapolitan breed, and in that of the white, to Chinese, which shows a very important improvement upon the old variety, in their aptitude to fatten quickly during the early stages of their growth.

It will be seen at a glance what an important matter this is to the breeder, who wants his animals to be ready for market quickly, and at the smallest possible expense in the cost of food. If one breed of pigs can be made fat at the expenditure of half the cost for barley-meal that another would take, the food saved, represents so much clear gain, or profit to the breeder.

It is said that, if the native breed is not crossed even now, when it seems to be established, once in six or seven generations with fine Chinese, or the Tonquin breed, that it would degenerate in form and quality. The original Berkshire, therefore, although a prime stock originally to graft upon, has been improved yet further in many essential particulars, though it has doubtless lost considerably in size, while, as remarked before, the breeds which make lean flesh, as in the present instance, correct the too fat-making tendency of some of the Chinese varieties, and it is by correctly balancing the advantages, and disadvantages of various breeds, that the skilful breeder obtains as much perfection as possible, though this cannot always be ensured in one or two generations.

It is the Chinese pig, or sub-varieties of the race, that is to be found in all Eastern countries, and the islands of the Eastern seas, and oceans, throughout Australia and in some parts of Africa and its adjacent islands; so that the family is a numerous one, to which the different varieties of English pigs are very much indebted for some of their best points as they now stand. The Chinese pig was originally obtained by us from the Indies, it has been thought, and a long while ago introduced into this country.

The wild hog is to be found all over the world, excepting in America and New Holland, where he was not originally found, the pigs in those countries having been established from importations made, the original stock in America having most likely been introduced by the Spaniards.

A few pigs set loose from a ship that has touched

at an uninhabited island for water, have been known to increase enormously in the course of a few years, and has afforded a large supply of fresh meat to the crew, upon the occasion of a renewed visit to the island some years afterwards, by the captain of the vessel who had put them on shore.

Descriptive Terms of Pigs.—It may be as well to say, on behalf of the uninitiated in such matters, that the range of animals, when collectively spoken of, are usually called pigs, hogs, or swine. The latter term sounds somewhat pedantic, but is the one usually used in works upon agriculture. The term "hogs" is that perhaps most in use amongst farmers, and "pigs" finds most favour amongst the non-technical classes. The male when not castrated is called a "boar," and the female a sow, and their young during their early infancy are called "sucking pigs," and at a little more advanced stage "porkers." Animals from five to twelve months old that are being kept for future use, and do not have fattening food given to them, are usually termed "store pigs."

CHAPTER II.

PIGS (*continued*):

Breeding—Choice of a breed—Points of a good hog—Choice of a boar—Choice of a sow—Management of the sow—Management of young pigs—The management of store pigs—Disposition of the produce of a sow for private use—Feeding—Experiments recorded by the Highland Society—Estimated number of pigs to acreage of farm, or to number of cows on dairy farm—Properties of different food—Table showing the nutritive constituents of grain, potatoes, &c.

Breeding: Choice of a Breed.—Sows usually farrow within little more than sixteen weeks of the time of being admitted to the boar, but the extent of the period of gestation is very various in different species, the term in certain instances, having been very much prolonged—even up to 140 days in rare instances, for which there does not appear to be any known cause, either dependant upon the age, or constitution of the sow, or upon diet, breed, or season.

In making choice of a breed of pigs, the breeder should take into account his own peculiar circumstances, and weigh over the characteristics of each breed, and think for himself which will suit him best.

In some country places butchers keep pigs, and they necessarily eat up a good deal of the offal of

slaughtered animals. The Chinese would prove a very unsuitable breed for a butcher, as the flesh, when the pig is fed upon animal food, would be oily and disagreeable; but it would be the exact breed to suit a dairyman, who had a large quantity of skimmed milk to dispose of, which, supplemented with barley-meal, or other farinaceous food, would fatten the pig off-hand very quickly, and profitably, and make delicious pork.

Of course butchers' pork is looked upon somewhat suspiciously, and "dairy-fed" pork is in request by buyers; but in both of these instances each must make provision to carry out his object in the best possible manner for his own profit; and although these are strongly-marked individual cases, there are less boldly divided grades of difference existing in the circumstances of all people, which would cause one breed to be more desirable than another.

In my case, as most of the skimmed milk is given to the calves, I have not an unbroken supply from the dairy, only now and then, when there does not happen to be any calves about, and I can manage to scrape together a good deal of rough food which costs me little or nothing, beyond the expense of collecting it. The black Berkshire suit me better than any other breed I could keep, but everybody's case would not resemble mine, and each pig-breeder should make choice of a breed of pigs that is the most likely to suit his own individual case, and bring in the most profit.

In the neighbourhood of London, and other large towns, where pork finds a ready market, the demand is greatest for the fine qualities of meat, this being

especially so in London; and the smaller breeds of pigs should be adopted where the intention is to sell the produce in the shape of pork.

In other districts, the principal demand may be for larger-sized fattened meat, when the breeding, and feeding of the larger sorts of pigs may be found to answer the best. Store pigs, as a rule, cannot be made to pay, except by those who have abundant room to turn them out upon the fallow fields, where they pick up large quantities of roots and weeds. Those who have the opportunity of turning them out, and are thus enabled to rear them cheaply, can always find a market for store pigs, locality being of very little consequence now railway communication is so complete; for, although fat pigs are bad travellers, and sometimes even die when they have only a few miles to traverse, store pigs may be sent any distance without injury.

Points of a good Hog.—There are certain good points that are common to all breeds which should be looked for in pigs. These are breadth of chest, depth of carcase, width of loin, chine, and ribs, combined with compactness of form; good, brisk, even temper, and general beauty of appearance.

The head should not be too bony, and the forehead rather convex and narrow, the snout fine, the mouth small, the cheeks full, and the entire face somewhat short, and straight to the crown. The eyes should be small, and, while quick in their action, calm looking; the ears thin and sharp, pointing forward, and pendulous; while the countenance should denote both sprightliness and docility.

The neck ought to be full and broad, and should

join broad shoulders, and broader chine, the ribs, loin, and rump being of the same regular uniform breadth ; the tail not placed too low, the back being straight, or only slightly curved, chest broad, deep, and prominent ; with well-set ribs, springing boldly from the chine, so as to allow healthy play for the lungs, and widely extended shoulders. The thighs, both inside and out, should be dense, and the twist wide and cleft ; the legs should be short, so that the animal's belly, when fully fat, should nearly touch the ground. In a perfect pig the joints are small, and the bone fine, the feet short and round, the hair of the body thin, long, and fine, having but few bristles ; and the skin, while thin and supple, without looseness or flabbiness.

Choice of a Boar.—To the above, which apply equally in their main points to both boar and sow, in making choice of a boar, he should be rather smaller than the sow, for if she is coarse, her progeny will be improved in form and flesh by the cross. He should be well fed, and not be allowed to serve too many sows—about twenty being generally thought sufficient. At eight, or nine months old, both sexes will betray a desire for coition, and although thus prompted by nature, which is mostly an infallible guide, the boar should not be used till he is a twelvemonth old ; ten months being often mentioned by writers as the proper age for copulation. But it is best to err on the safe side in this respect, for, if used too early, the generative powers of both animals become impaired. The sow will soon become worn, and prematurely aged from breeding, and will produce unhealthy litters ; while the boar will become stunted in his growth, and show signs of age

sooner than he ought to do. Boars retain their powers for many years.

Choice of a Sow.—The sow should have a deep and capacious belly, and not be too fat before taking the boar, for if in too high condition she will in all probability only bring an indifferent litter of pigs. She should also have at least a dozen teats; for it may frequently be noticed that each little pig, while sucking, attaches itself to a particular teat, and if there be not as many teats as there are pigs, the unlucky supernumeraries can only help themselves here and there, when the others leave off sucking, and therefore soon fall off in condition, and are often in consequence not reared.

The time of copulation will depend very much upon the breeder's convenience; but with the view before expressed, of avoiding the extremes of each season, April and October are the best months, unless other considerations are allowed to prevail. In the two months above named, the sow will farrow in the latter parts of August, and February. In the first named case, the young pigs will have attained a sufficient age to enable them to stand the cold weather of winter. In the latter they will grow up sufficiently to allow them to be turned out on the stubble-fields after harvest, and pick up a good share of their own living from the waste and litter that is to be found there.

Management of the Sow.—If it is the custom of the breeder to allow his pigs to wander about, the sow when in pig may be allowed to go with the rest, until a short time before she is due to farrow, when she should be removed to a convenient sty, or pen, and fed upon wash, whey, swill, or any ordinary kind of food. As

her time draws near, she should be watched carefully, and this may be known by her carrying straws in her mouth with which to form her bed. This should be restricted to a moderate allowance of short, dry straw ; otherwise where there is a too ample, thickly-strawed bed, and the straw is long, the pigs are endangered either from being smothered, or the mother lying down upon them. If the sow be very heavy, and have many young, the accident of over-laying, when they get crushed to death, is very common, in consequence of the little pigs nestling under the long straw.

At this time the sow should be well fed with nutritious food, as milk, warm wash, or swill, mixed with pollard or meal. It not unfrequently happens that a young sow will eat her young ones, so that she should be watched, and fed with judgment when immediately about to farrow, allowing a sufficient interval. The young pigs should be allowed to eat with the dam to prepare them for weaning, about which there will be no trouble, merely requiring to be removed gradually. The average number of pigs produced by a good sow will be about ten in the large, and twelve in the smaller breeds ; but from fifteen to twenty pigs produced at a litter are not uncommon. The large litters, however, are not always the most profitable, as they usually have amongst them some very weakly pigs that can be seldom reared to advantage. About a week after farrowing, the sow may be allowed to leave her sty for a short time each day. If turned into a grass field, the herbage will improve the sow's milk, and the pigs will grow faster.

Management of Young Pigs.—When the young pigs have sufficient strength, they may be allowed to have

a run with the mother, but not into the filth of some farmyards, where they would stand a good chance of being smothered in the litter, but into a fresh, dry paddock; the time they are allowed to remain out must be regulated by the ultimate object for which they are intended. If they are meant to be reared as porkers, the less exercise they get the better; but if meant for store pigs, it is immaterial.

If the litter should be too numerous, it will be found prudent to lessen their number, and kill some of them as sucking pigs, or roasters, at the age of a fortnight or three weeks, to relieve the sow of too great a strain upon her system by suckling so many. Eight or nine are, perhaps, fully as many as should be left for the sow to bring up.

The sow should at first have warm gruel, in which some sound, strong beer may be mixed as a cordial; and while suckling, as the pigs must be fed through her, during the whole period of her nursing, she should be supplied with warm kitchen, or dairy wash, and have an abundance of nutritious food, and in the middle of the day a substantial meal of dry food, consisting of steamed potatoes, pea and barley-meal, or other substances of an equally nutritious description.

At the end of three weeks, the males may be castrated, though many defer this operation till they are six weeks old, and if thought necessary, the females not intended to be brought up as sows, may be spayed when about a week older, or later on whilst suckling. But this should not be left longer than six weeks from the date of birth, for they should be weaned at eight weeks, and enough time should be allowed them to recover from the operation.

The young pigs should be fed at least three times a day immediately after weaning, the food consisting of meal, mixed with wash or whey, and given warm. In a week or two's time, they will be able to eat potatoes, when the warm foods may be discontinued.

The young pigs, however, even when sucking the mother, should not be left entirely to the nourishment they are able to obtain from her, but should have skimmed milk, whey, or wash, with a little meal mixed in it, made warm, and given to them two or three times a day. This should be put into a corner of the sty in a trough, and a hurdle placed crosswise to keep off the sow from monopolising the whole, and so placed that they can help themselves when inclined. They will thus not only be learning to wean themselves, but in six weeks or two months will generally weigh from 30 lbs. to 36 lbs., and will be quite strong enough for weaning, and be able to do without the sow. It is the best course not to take them away suddenly, all at once, both on account of the mother as well as her young, for the former would perhaps be left with more milk than was convenient, but they should be gradually separated from the sow, allowing them to suck at first twice a day, and afterwards only once a day, taking the strongest pigs away first, and leaving the weakest with her for a few days longer.

Should there be thought to be a danger of a young sow eating her young ones, which can only be guessed at from the sow's displaying a somewhat savage, and gluttonous temperament, it is a good precaution to sponge the backs of the pigs immediately after they are born, with a strong infusion of aloes, in lukewarm water, and its bitter taste will render them too un-

palatable to be eaten. Doe rabbits often eat their young, and this is caused chiefly by *thirst*, and in the case of the sow plenty of meal and water made thin, abundantly supplied, will content her, and she will then complacently allow herself to be sucked by her little ones after being well fed.

The sow, after having farrowed, should be kept confined to her sty for at least a week; and the boar should not be allowed to come near the young, for he would be sure to devour them if he had the opportunity of doing so.

The young pigs, after being removed away from their mother, should be warmly, and cleanly lodged, and fed regularly and carefully, until they get strong enough, and acquire a relish for roots, when, if they are intended for store pigs, inexpensive and coarse fare may be gradually given to them, together with distillers' or brewers' grains, and bran.

Grains, when pressed down and kept for a few months, undergo a kind of fermentation, and are much more serviceable to hogs than when fresh. They may be bought of the London brewers at about a shilling a quarter, but they are generally contracted for, as the brewers require them to be removed immediately, and taken out of their way without loss of time, and there are men who make a business of dealing in grains, who supply cowkeepers and others with them. At one time, when disease extensively prevailed amongst the London cows, the brewers had great difficulty in getting rid of their grains, and I had a large quantity given to me without payment by one of the large London brewing firms, upon one occasion, who had been left in the

lurch by the man who had contracted for them, who found it did not answer his purpose to take them away, which I found a valuable assistance in feeding my stock of all sorts, for cows are exceedingly fond of grains as a change of food.

In the country, however, they fetch a much longer price, about sixpence a bushel being often got for them; so many cottagers, and others keeping pigs, who are glad to avail themselves of this useful article in pig-feeding economy.

Porkers which are intended to be killed at an early age should not, however, have anything given to them in the shape of wash, or refuse of the kitchen, for, although highly nutritive, and the pigs will thrive well upon it, the meat when dressed will not be nearly so delicate, and fine flavoured, and have a more greasy appearance. They should never have anything else than skimmed milk and meal, excepting, perhaps, potatoes and parsnips boiled. The parsnips are supposed to give a nice, sweet flavour to the flesh, and, as they are a favourite crop of mine, I use a good many in feeding young pigs, which can generally be made to weigh from seven to eight stones at about four months old, and parsnips and potatoes ease the consumption of meal.

The Management of Store Pigs.—Store pigs never pay anyone to keep when they have to be shut up, though they answer well enough when they can pick up their own living, and can get enough food, which matters not how coarse it may be, provided that it is *sufficient*, the object of rearing store pigs being merely to support them until they reach the proper age for being fattened, and they are commonly allowed to

run loose about the farmyard and straw-yard, where they pick up the sweepings of the barn, and the refuse of turnips, mangolds, and cabbages, given to soiled cattle.

As this, however, sometimes proves inadequate, they are often turned out to graze, and green crops are sometimes cut for them ; but it does not pay to thus treat them, and they never can be made to pay, unless, as before stated, a large quantity of food can be given to them which costs little or nothing.

Some farmers allow them to graze over the artificial grasses, which occasions a great waste, both of food and manure ; but the case is different when they can be turned out into the stubble-fields to glean the shed corn, and eat the roots of the weeds, &c., they turn up. It is also a different matter when they can be turned into woods, to pick up the acorns and beech-mast. When plenty of these abound, they will get into such excellent condition, that a few weeks' course of feeding upon barley-meal, &c., will cause them to be fit for the butcher.

When turned out, a small quantity of grain, or better food than they are in the habit of getting, such as boiled potatoes—or better still a handful of pease or beans—to warm their stomachs, should be given to them at night ; which induces them to return quietly home, and they are thus kept under better control.

It is necessary to ring them if turned out upon the pastures, to prevent them from grubbing ; and a triangular frame of wood, strongly put together, and fastened round their necks, will prevent them forcing their way through hedges, gates, and other enclosures. Sometimes either the ring or the cartilage gives way,

and occasionally when I have allowed an old sow and her young to be turned out, she has made holes in the meadow large enough to bury herself in, and inflicted damage that has taken a good deal of pains to repair, turning up the ground for a considerable distance, and creating no little astonishment in my mind as to what animal had caused the damage, before I became acquainted with the sow's natural proclivities.

It has been stated that, the process of "ringing" may be avoided by paring off with a sharp razor the gristle of the snout, or by cutting the two strong tendons of the snout, about an inch and a half from the nose, without injury, or prejudice to the animal at an early age, as the wounds soon heal, and cause but little pain; the time for performing these operations being when the pig is about three months old. With respect to this prescription, a writer in the *Encyclopædia Britannica* drily remarks, that, "so far as he can credit the testimony of the pig, it certainly seems to think otherwise, and seldom refrains from expressing its dissent in a very unequivocal manner." I do not like the idea of mutilating animals myself, and should scarcely consider the plan an advisable one to adopt; but the necessity for having recourse to any such methods in my own case is removed by my practice of nearly always keeping the pigs in their styes, where their manure is always accumulating and under command; though I allow them occasionally to be turned out in the plantations, when I can hire a boy to look after them. As a rule I am not fond of employing boys; for they are given to "larking" and following certain amusements of their own, in the pursuit of

which they will allow their charges to wander off, as it may be metaphorically expressed, from Dan to Beersheba, or go to Jericho, if they choose, so that they have their "fling"; boys, as a rule, wanting the master's eye over them, and, as I am generally away in the daytime, I prefer to trust to steady *men* to do my work for me.

Disposition of the produce of a sow for private use.
—When the produce of a sow is intended for the private consumption of a family, it will be found convenient to divide it into some such form as the following; but it may be premised that, in the case of porkers, a portion may be pickled, to be eaten as pickled pork, the joints best adapted for this purpose being the flat belly-part, the hands, &c.; using the legs, loins, &c., as roasting joints. The head, and some portion of the neck, will make collared pigs' head—a breakfast and supper dish of which many are very fond. I will suppose that, when intended for private consumption, the smaller breeds of pigs are kept, as the improved Essex, Suffolk, or the smaller breeds of Berkshire.

Assuming the litter to consist of nine, three may be used as roasters, or sucking pigs, and the remainder left for porkers and bacon hogs. There will thus be left six pigs to deal with. Four should then be weaned after a proper interval, and two kept with the sow, of which one should be killed at about twelve weeks, and the other at sixteen weeks old, or a little more. Two, out of the four pigs at the time of weaning, should be shut up together in a sty, and regularly fed with skimmed-milk, mixed with pollard, and made lukewarm. These will be made in fat con-

dition, and be ready for killing, making very fine meat, at any time from six to eight months old. The remaining two pigs which have been treated as store-pigs, and fed upon rougher and inferior food, such as potatoes, and wash from the kitchen, may be made ready, fattened, and killed as bacon hogs when they are twelve months, and eighteen months old respectively; one being killed about March, and the other in the following October. By this means a supply of fresh pork, pickled pork, and bacon, will be provided throughout a great portion of the year; and by judicious management, so as not to have too much of one sort to be eaten at once—which is apt to sicken people, so that even the servants refuse to eat pork, and get surfeited upon it—an abundant supply for the greater portion of the year may be conveniently distributed.

When persons have obtained a thorough good breed of pigs, they are too apt to content themselves with what they have got, which they think require no further improvement, and so continue to breed in and in, which, though sanctioned to a certain extent, in some instances cannot be continually followed without unfavourable consequences ensuing; for although the animals, to the eye, may present the same satisfactory appearance, they will in effect grow delicate, become bad feeders, and fall off in weight.

This is a bad course to pursue in the case of all animals, but in that of pigs it has been stated that, where the practice was continued for an indefinite time, in a certain instance, the sows almost gave up breeding entirely, and when they casually had a litter, the progeny were so small and tender, that

they lived only for a short while after they were born.

Feeding.—Store-stock cannot be profitably kept when shut up in styes, but there may be breeding sows to keep, and at times some store-stock, either to eat up a supply of rough food, which may be kept for fattening ultimately, or for bacon hogs.

For the use of these, there should always be a copper boiling of refuse vegetables, in an abundant supply of liquor, to which a small quantity of meal, or pollard should be added, or even bran, for merely the husk of corn contains a large amount of nutriment, possessing valuable constituents of which the green stuff would be deficient.

The trouble of cooking the food has often been urged as an objection against cooked victuals, but a system of *routine* will soon make this easy, and I have found that, when men have their allotted task given to them, which they are obliged to fulfil as a matter of habit, the *trouble* is soon lost sight of, and the man who farms for *profit* must take the best means in his power for ensuring it; and the question of profit and loss, hinges entirely upon economy in feeding, so far as pigs are concerned. As may be seen from the foregoing, in some instances pigs want the best quality of food that can be given to them. It will in these cases be obvious, that the sooner they are made fat, the less the expense of their food; and with this object in view, breeds that fatten rapidly must be selected.

Good food would be thrown away, very often, upon some breeds of store-pigs, which would eat such a large quantity of expensive food, if given without

proper judgment, that it would be quite impossible to avoid a loss upon them.

Many a well-meaning farmer may be heard roundly to declare that, for his part, he likes to see his animals well fed; and he carries this out so thoroughly that he feeds them often at a loss to himself; and while his considerate feeling does him honour in caring for the brute beasts in his possession, his business qualifications are not sufficiently developed, and he is often ignorant of the breed of animal he ought to keep to do justice to the ample supplies of food he furnishes them with, and with such a class of men, it is unfortunately too much the fashion to despise those economical plans, and methods, the following up of which in a thorough manner, is the only way to *make farming pay*.

No animal ought to be half-starved, and insufficient feeding will never answer the purpose to pursue with any class of animals; but if good food is given when inferior will answer the purpose, it is so much profit of the business thrown absolutely away.

The use of cooked food is much more economical than raw, and this practice, though exemplified long ago by many careful experiments—fifty years, or more ago—is only now slowly finding its way, and being followed partially by many keepers of stock.

The Highland Society, in 1833, offered premiums for trials with steamed food and raw food respectively, with the result, that the steamed food was much more efficacious than the uncooked; but in the case of oxen the general result was made to appear that the advantage gained in preparing the food was counterbalanced by the cost of fuel and labour.

The estimate of that cost was, however, far too high, and very economical methods of preparing food for cattle in winter-stall feeding are now followed, to the increased profit, and advantage of those enlightened husbandmen who follow them. The Society's published account of experiments made with pigs, are, however, interesting even at this date, two of which I herewith give.

Experiments recorded by the Highland Society.—

Mr. Boswell, of Balmuto and Kingcausie, caused his overseer, on the 1st of December, to put up ten pigs, all of one litter, in two lots of exactly the same weight, each being collectively 5 cwts. 2 qrs. 22 lbs. The food employed was round red potatoes and the best oatmeal; those on raw food having the meal given them made up in the manner of "crowdy," or mixed up with a little cold water; and the lot on prepared food having the potatoes boiled, with the oatmeal made into a common porridge.

From the first, Mr. Boswell says, it was clear that the lot on prepared food were fast beating the others, and an increased quantity of oatmeal was given to the lot on raw, in order to make them ready for sale along with the others; yet still they were greatly deficient on the 1st of March, at which time the experiments being concluded, they were put on prepared food, when they instantly began to make up the lee-way.

The live weights of the several lots on the 1st of March were:—

	cwt.	qr.	lb.
Those on boiled food	10	1	1
Those on raw do.	8	1	15

The above results show a striking difference and a decided advantage in using prepared food, but the

expense of that preparation is made to come out, in addition to the cost of the food, at £6 19s. 4½*d.*, while the cost of the raw food was only £5 8s. 6*d.*, thus bringing up the expense of cooking to £1 10s. 10½*d.*, a far too high an estimate, amounting to more than 20 per cent. of the value of the food. Against this increased cost, the flesh gained of the pigs fed on prepared food was exactly 210 lbs., equal to fifteen stone of 14 lbs. live weight, which, if only estimated at 4s. per stone (6s. would be nearer the mark now-a-days, and at times, for fine meat, even considerably more), would still leave a surplus profit of 5s. 10*d.* per pig, while it may be presumed that the animals in the prime condition would realize a better price than the others.

Again: Mr. Walker, of Ferrygate, on the 4th of March, put up two lots, containing five pigs each, of the same brood, at two and a half months old. They were separately fed, the one on steamed, and the other on raw potatoes, with an allowance of 2½ lbs. of broken barley to each lot, the barley for the steamed lot being prepared along with the potatoes. The live weight of the two lots was separately—

That on raw food	. . . .	108 lbs.
That on steamed	. . . .	106 „

and the following account exhibits their several improvements:—

March 19.	Pigs on steamed food	. . . .	114 lbs.	} Difference in favour of steamed food, 3 lbs.
„	„ on raw ditto	. . . .	111 „	
March 30.	Weight on steamed food	. . . .	137 lbs.	} do. 13½ lbs.
„	„ on raw ditto	. . . .	123½ „	

May 1.	Weight on steamed food . . .	205 lbs.	} do. 30 lbs.
"	" on raw ditto . . .	175 "	
June 1.	Weight on steamed food . . .	279 lbs.	} do. 56 lbs.
"	" on raw ditto . . .	223 "	

The result of this experiment showed that the pigs on steamed food had increased 173 lbs., being 67 lbs. more than double their original weight; while those on raw food only gained 115 lbs. The potatoes were, however, given in unlimited quantities to each lot, without being weighed; so that we have no account of the quantity each consumed, nor of the cost of preparation; but the reporter states "that he does not think it possible to make pigs fat on raw potatoes without other food, when confined to them alone."

Estimated Number of Pigs to Acreage of Farm, or to Number of Cows on Dairy-Farm.—Calculations have been made at various times by writers upon agriculture as to how many pigs in proportion to its size may be kept profitably on a farm, and also how many upon dairy-farms according to the number of cows kept.

Brown, of Markle, considered that one pig should be reared, and fattened upon every six acres of land under corn-crops; and by Henderson, upon seven acres and a half, with no other food than the refuse of the cattle, the kitchen and the dairy, together with some tares and clover during the summer, and roots in the winter.

To keep up a stock of forty pigs, in addition to what they might be able to pick up about the farm, about an acre and a half of artificial grasses, and the same quantity of potatoes, are computed to be sufficient. Lucerne, broad clover, and sainfoin, are all

good food for pigs, but tares and pasture grasses are too succulent, and are apt to scour the animals, unless corrected with a certain amount of farinaceous food, which, perhaps, would be best given to them in the form of bean-meal porridge.

And here I must remark about beans, that, being a heating food, they may be used with great advantage in correcting the effects of cold diet, upon which pigs may have been mainly fed; but given in large quantities, their heating effects may be seen in an eruption, which will break out about the ears of pigs. Where beans are used—in those cases where a good many are grown on stiff land farms, and it necessarily becomes desirable to use this produce, rather than purchase other kinds—a proportion of potatoes should be used, together with a liberal supply of salt, which will be found to correct this tendency to irritation.

Chicory, comfrey, cabbage, cole, mustard, and lettuce, are all good food for pigs. Of these the cabbage requires the most care and cultivation, but it is more stable food than the others; and the drumhead variety may be grown to an enormous size, and weight. Artichoke, comfrey, chicory, cole, and mustard, are all "cut and come again," and may be mowed several times during the summer.

With regard to feeding pigs, however, upon these green crops, there are so many different circumstances in connection with their growth, and the nature of the land, that no definite system can be accurately laid down to be followed. It may, however, often answer the purpose to cultivate a patch of these, where they are not grown to any extent as main crops, with the view of being of use to the pigs.

One store-pig to every cow is frequently allotted by writers upon dairy-farms. But no fixed rule can be laid down even on this head ; as, in the first place, the average quantity of milk produced will depend a good deal upon the breed of cows, whether they are large or small, and whether the product is manufactured into butter or cheese, for butter-milk is far superior to whey ; and the breed of pigs, again, must be taken into account, as some kinds would consume double as much as others, and in the same districts, the number of pigs kept varies very considerably.

According to the *Buckinghamshire Report*, in the Vale of Aylesbury, which is famous for its production of butter, and is the great dairy district of the county, one farmer says, that the average of pigs fed solely upon skim-milk, is about six or seven bacon-hogs, and ten porkers to a score of cows. Another states that, with the same number of cows, he can fatten fourteen bacon-hogs of fifteen score each in a year, giving them some corn with the milk.

A third says, that thirty cows will, in the course of the year, fatten seven or eight hogs from sixteen to eighteen score each, sold at one year old, and forty porkers of five or six stone each. The most usual mode, however, is to keep a dozen pigs to a score of cows, and to sell them as porkers at about sixteen weeks old ; by which means each cow may be supposed to rear a pig and a half, of eight, to nine stone each, or about twelve, to thirteen stone of pork, annually.

Properties of different Food. — Unfortunately, many breeders of stock are not sufficiently acquainted with the nature, and different properties of the food with

which they feed the animals in their charge, and the effect that each is calculated to produce; for one will not serve the purpose of another, each being intended, as it were, to perform a certain office. Life may be sustained indifferently upon all, warmth-giving food being the most necessary element, an animal having been compared to a steam-engine, the furnace of which requires to be fed with fuel, and in the same way life-heat is kept up by the food supplied to the system of the animal; and thus, where beasts are coldly lodged, they will require more food to keep up the animal-heat necessary for their health, and comfort, than if they were warmly lodged.

But those foods which abound most in warmth-giving, and fat-forming substances, are not capable of adding to the flesh of a growing animal, nor will the flesh-forming food increase the amount of fat.

Take the item of malt-dust, which, in my district, used to be next door to thrown away at one time, being only used for manure, which, in value of application in that form, bears only a trifling proportion of its value when used as an article of food for stock. There is positively 30 per cent. of flesh-forming material contained in it, a higher per centage, perhaps, than contained in any other description; peas, beans, tares, and lentils, containing 25; bran and middlings, 18; oatmeal, 18; oats with husk, 15; while wheat contains only 12; and barley, 11 per cent.; Indian-corn ranking with the latter, as well as buck-wheat.

On the other hand, wheat contains 70 per cent. of warmth-giving food so necessary to the life of man that it has earned for itself the name of being "the

staff of life ;" but this is actually exceeded by rice, which contains 80 per cent. of this necessary constituent. Rice, however, possesses only 7 per cent. of flesh-forming material, while wheat has 12 per cent. Almost the entire bulk of rice may be said to consist of starch.

Bone-making food is found in the largest proportion in the bran, or outer part of grain ; *ergo*, in feeding young animals, bran and pollard are useful in building up the bones and frame, where they are intended to be kept till they attain their full maturity, and fine specimens are wanted ; yet bran is often regarded by those unacquainted with the subject, as possessing but little value as an article of food ; yet where bone is wanted to be built up, it is the best food that can be given ; although, on the other hand, where bone is *not* wanted, in the case of young porkers, but fat and flesh, bran, of course, will not be found serviceable.

Flesh-forming food is met with in the largest proportion in wheat, oatmeal, peas, beans, and middlings, and to a somewhat less degree in Indian-corn and barley.

The food which forms fat, is found in the largest proportion in oatmeal, bran, middlings, the yellow variety of Indian-corn, and in fatty, and oily substances generally ; and thus, collectively, as various foods exercise different offices, or functions, it may be seen at a glance that a variety of mixed foods is even *necessary* to animals, and Nature, prompting the desire of a change of food in the mere innocent gratification of appetite, causes the execution of a necessary work that requires to be performed on the system, and a hidden design is thus, as it were, perfected by the

Great Creator of all things, through the inclination, or desire of the appetite of the creature, to perfect a necessary requirement to its own well-being.

The following rough table will show at a glance the different percentages of the various constituents of grain, pulse, potatoes, &c.; where a blank is indicated by a mark, thus —, it must be taken to indicate that the quantity has not been exactly ascertained, or is not necessary to point the illustration I am aiming to furnish:—

TABLE
SHOWING THE NUTRITIVE CONSTITUENTS OF GRAIN, POTATOES, ETC.

Every 100 lbs. of	Water.		Flesh-forming food (Gluten, &c.)		Fat or Oil.		Warmth-giving food (Starch, &c.)		Husk and Fibre.		Bone-making substances, &c.	
	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.
Oatmeal contains	9	18	6	63	2	2						
Oats, with husk "	9½	15	6	47	20	2						
Barley "	11	11	2	60	14	2						
Wheat "	12	12	3	70	1	2						
Bran, middlings, &c "	14	18	6	53	—	5						
Malt dust "	6	30	—	—	—	8						
Indian corn "	10	11	8	66	5	1						
Rice, husked "	—	7	—	80	—	—						
Buckwheat "	—	11	—	—	—	—						
Peas, &c. }												
Tares }												
Beans }	15	25	2	48	8	2						
Lentils }												
Potato "	75	2	—	19	3	1						

CHAPTER III.

PIGS—(*continued*).

Fattening—Experiment of Feeding upon Rice—Salt in Food—Old Rule to determine the Profit of Fattening Pigs—Slaughtering—Scalding—Singeing—Cutting-up—Curing Bacon and Hams—Smoking—Market for Bacon and Hams—United States Hog Crop of 1872—Method of Curing Bacon in Wiltshire—Westmoreland Hams—Hampshire and Berkshire Methods—Continental Practice of Stripping off the Skin—Pig-styes—Experiment by Lord Egremont.

Fattening.—The best times for pigs to be fattened in readiness for killing, are the periods of the year about March, and October. For private use, where only a few hogs are wanted, this will ensure having fresh cured bacon all the year round, but pigs may be fattened to advantage during all the winter months, though they should never be slaughtered during the heats of summer.

Although pigs are very often fattened, and reach great weights, at ages not exceeding eight, or ten months, and the bacon presents that streaky appearance, and admixture of fat and lean that is so much admired by connoisseurs, the flesh is not so firm or nutritive as that which is older.

Where hams are in question, a pig is not in his prime until two years, and if kept longer the meat

will have a still better flavour ; for however delicate and palatable young pork may be, particularly when used in the form of pickled pork, yet when the flesh is converted into bacon, it is deficient in that firm consistence of fat, which constitutes its main value, and which can only be had in perfection when it has acquired a certain age.

The Chinese breeds, and some of the improved breeds which have a large admixture of their strain, will reach their full growth within a year ; but many of the larger breeds increase in size and weight with good feeding, as much, or more, during the second year as they do in the first.

It has been said of the Berkshire breed that, when fed liberally and reared properly, they will reach 40 stone of 14 lbs. at thirteen or fourteen months old ; and when two years old, from 50 to 60 stone.

My breed being an *improved* Berkshire, never reach the latter named weights, the tendency to fatten early which they acquired by their crossing with another breed to bring this result about, having doubtless interfered, as might be expected, with their greater powers of development at a more mature age.

I find, however, that if I put up pigs to fatten at eighteen months, to two years old, after they have been kept upon rough and indifferent fare, they make very rapid progress, and the plan I pursue generally is to give them boiled potatoes mixed with a *little* barley-meal at first, gradually diminishing the quantity of potatoes until at the end they are finished off entirely with barley-meal, and perhaps a little whole corn.

Sometimes hogs of large breed have been shut up

for five or six months fattening, but I must say I cannot understand such practice, where profit is aimed at, for my part ; for the consumption of food must be very great. As a rule, it will be found most advantageous to fatten the male stores at an early age, but a breeding sow should always be allowed to have four or five litters before she is slaughtered, and during this time she will be improving in her character as a bacon-pig, while yielding the profit of her litters.

But I have always found that I could make my breed of pigs, even when of large size, sufficiently fat upon two sacks of barley-meal, given as before stated in conjunction with other food, and one of the largest sows I ever fattened of this breed (improved Berkshire) consumed only five bushels of barley-meal. Her food at first consisted of acorns, of which I get large quantities, giving a shilling a bushel to the wives and children of the labourers for their collection, and pollard, together with potatoes, finishing off at last with a sack of barley-meal, given alone, the other bushel of barley-meal having been given gradually and distributed beforehand with the other food.

The common view of regarding the subject is, that when hogs have attained to the proper age for making bacon, even if they are in such good fat condition as apparently to be fit to kill, yet for some weeks, at all events, they must have a different sort of food, in order to harden the flesh and give it that mellow firmness which is so desirable in hams and bacon.

With this object in view, many feeders, who thoroughly understand their business, commence by giving them about two-thirds of steamed potatoes

and one-third of pease, and barley in equal proportions, ground up into meal; increasing the quantity of meal as the hogs get fat. By this method it is commonly computed that, a good feeder will in twelve weeks consume from 14 to 16 bushels, and by the time he has eaten it, will probably have doubled his weight.

One bushel of peas, to four of oats, and four of barley, or three or four bushels of potatoes with two bushels of ground oats and barley boiled, are thought good mixtures. The best of all is considered to be barley-meal and white peas, the peas being given whole, and the meal mixed with skimmed milk.

Potatoes, though capital food for store hogs, or as preparatory food for hogs about to be fattened, as in the case of mine, which do not, as a rule, have such good food as boiled potatoes carefully prepared alone, should never be relied on to fatten hogs entirely, as the flesh would be far inferior to those properly fed, which require food of a nature that will harden the flesh. Potatoes, however, boiled or steamed, and mixed with stained barley, tail-wheat, or other grain coarsely ground, make excellent food. It is indeed highly necessary to take the rough edge of their appetites off these large hogs, with an ample quantity of food of a less expensive description to that which should be given to finish off with, by which means the good flavour and condition of the meat is secured, as it is sometimes computed that five sacks of barley and one of peas will be required to fatten a hog of 60 or 70 stone. In the *Sussex Report* there is an instance related of a Berkshire hog that was put up to fatten on the 28th of August, and killed on the 8th of the

March following, which consumed the enormous quantity of 78 bushels of pease, barley, and oats. He made a very large hog, however, for his dead weight was 82 st. 7 lb.

The quantity of food consumed will, however, depend upon the size, breed, condition, and last, but not the least important, the disposition to take on fat. If a large animal, he will consume for the first few weeks from $1\frac{1}{2}$ to 2, and in some cases even $2\frac{1}{2}$ bushels weekly, the calculation usually being that the animal's weight will increase 9 or 10 lbs. per bushel, or if a large hog, and a good feeder that thrives upon his food, he may gain in weight at the rate of 2 stone per week.

After a time, the consumption of food will fall off, and the increase in weight will be more than proportionately diminished, so that he will not pay for further feeding. This result may be seen from the following instance of a pig that was put up to be fattened and regularly weighed at intervals:—

Oct. 10	. .	Weight 36 st. 7 lbs.		
„ 24	. .	„ 41 „ 5 „	. .	38 lbs. gain.
Nov. 7	. .	„ 45 „ 7 „	. .	34 „
„ 21	. .	„ 47 „ 2 „	. .	11 „
Dec. 5	. .	„ 48 „ 7 „	. .	13 „
„ 22	. .	„ 48 „ 6 „	. .	1 lb. loss.

As they increase in fat, the appetite gradually falls off; and, as may be seen in the above instance, the improvement after a certain time diminishes, so that the grand secret is, to fat hogs up to their best paying point, where their improvement in weight makes the largest proportionate increase in the animal's value, and then kill them off.

Beans make the lean of pork extremely hard, and this is a well-known objection to the use of acorns ; but experience has shown me that so long as the last food given is of the proper, and best kind—say for the last month or so before the pig is killed—it will get over the effects of any previous food that may have been given to it, and will derive all the advantages to be obtained from food of the best character, as if it had always been previously fed upon it. This would doubtless not be the case where pigs have been neglected, and their health and constitution very much impaired by general inattention, and bad feeding ; but I am now supposing that the animal has been carefully tended and kept in fair, sound condition, though he has mainly subsisted upon rough food.

Experiment of Feeding upon Rice.—In the *Sussex Report* an experiment is recorded as having been made by Lord Egremont, of feeding pigs upon boiled rice. Ten porkers were put up on the 3rd of November, and killed on the 30th of December, the total weight of rice consumed in that period being 27 cwts. 9 lbs., or, upon an average 303 lbs. each—equal to six bushels of common barley per head. The total live weight gained was 623 lbs., and the cost of its production being nearly 5 lbs. of rice to 1 lb. of meat ; it follows that as good East Indian rice can be bought for 8s. per cwt. or less, that the pork would cost something under 5d. per pound. The value of the manure may well be placed against the cost of attendance.

It was assumed by this experiment, made many years ago, that these results would just pay the feeder when pigs could be sold alive at 5s. 6d. per stone of 14 lbs. ; or, if slaughtered, when pork is worth 3s. 8d.

per stone of 8 lbs.; for the difference between the gross live and dead weight of the pigs was:—

Live weight	1668 lbs.	} Difference, 366 lbs.
Dead weight	1302 „	

which gives the proportion of dead weight gained by the feeding at 486 lbs.; so that the cash account of the feeding and sale would stand thus:—

Food	27 cwt. 9 lbs. of rice, at 8s. per cwt.	£10 16 8
Produce	{ 44 st. 7 lbs. live weight, at 5s. 6d. per st.	12 4 9
	{ 60 st. 6 lbs. dead do., at 3s. 8d. „	11 2 9

Of course the chief value of these experiments lies in the fact that definite results are obtained, which illustrate what can be done by purchasing food at a certain rate, and the returns that are to be got from them. It also necessarily follows, that if cheaper substitutes can be wholly or partially provided that will answer the purpose, the profits will be proportionately greater.

Cheap food is to be bought for pigs at times, such as the sweepings of corn-market houses, granaries, docks, bakers' sweepings, &c., which will answer the purpose to be fed dry, which a few pig-feeders have said is the better plan of the two, an experiment having been recorded, made by a farmer who took two pigs of the same litter, and of similar weight, and fed them apart, one upon barley-meal mixed with swill, or wash, and the other with dry meal, having his drink given to him an hour afterwards. At the end of six weeks both were weighed, and the hog fed upon dry food was found to be a stone heavier than the other.

The argument in favour of feeding with dry food

is founded upon the suggestion that the practice is less wasteful than mixing with water, which in winter is liable to be frozen, and in summer to be baked to the sides of the troughs. But these are extremely questionable results, for pigs ought never to have food of such good quality as meal and water standing in their troughs, which ought only to be given to them in such quantities at one time as they will lick up clean; and the chances are, that if dry meal is given to them, they would turn out of the feeding trough, and spill upon the ground much more than when it was mixed with water, and the method is opposed to the generally accepted views held upon this subject.

Salt in Food.—Salt should be given to pigs mixed up in their food, in the proportion of a pint, to two bushels of barley-meal. It helps to keep them in health, and supplies a want to the system, and, as well, the delicacy, and flavour of the pork is said to be increased by its use.

Fatting pigs require to be fed three times a day at regular hours, and the troughs should always be kept clean—if washed, so much the better; and all food should be given in the sweetest, and most attractive state, so that the pig will readily eat it all up. When barley-meal and water, or skimmed milk, is given in too large quantities, more than the pig can eat, the meal will sink to the bottom of the trough in time, and the water, or milk be at top. The latter will have the dust and all impurities blown upon it, and get sour after some hours' exposure, so that the animal does not relish it so much as when only as much is given to him as he can eat at one time; and a little change of food is desirable now and then.

Old Rule to determine the Profit of Fattening Pigs.—The main element of keeping pigs at a profit, should be based upon the principle that from one source and another a good deal of inexpensive food can be got together for them at a small cost, which, improved in character by the addition of either bought food of the right sort, best calculated to supplement it, or produced upon the farm, can be supplied to the best advantage.

If a farmer can buy malt-dust to mix with roots, or bran, to make up for those constituents which are lacking in the food of his own production, that he has to fall back upon, and upon which he feeds his pigs in an economical manner; it is better than using his own corn, if he can sell it for more money than the substitutes he employs; but there is an old rule in existence for determining the profits upon fattening pigs, which says that the business will be profitable when a pound of green, or fresh-dried bacon, is worth more than the tenth part of the price of a bushel of barley.

Slaughtering.—Pigs are slaughtered, and prepared for curing in a wonderfully short space of time in Chicago, where every convenience upon a large scale is provided, the business being carried out in the most complete, and perfect manner; the slaughtering being effected with the greatest rapidity, dispatch, and noiselessness, offering a favourable contrast to the proceedings as they are often managed here, and the heart-rending cries that are heard in some country places in England when a pig is being killed, and the whole parish disturbed.

The best, and simplest mode of killing, is to have

an axe, or hammer, with a strong handle, about three feet in length, and a kind of spike about three inches long at the end, in place of the usual flat head. With this spike-end, the butcher strikes a sharp blow on the part of the head where the brain is situated, immediately upon the curl of the hair below the forehead, so that it enters the brain. The pig will then die instantly. The butcher must then immediately open the aorta with his knife and let out the blood, and the work of slaughtering is done. By this mode many pigs may be killed in a few minutes.

Scalding.—When the pigs are intended to be scalded, the carcase should be placed upon a low board of convenient height for the purpose, and scalding water should be thrown over it; then quickly scraped with a knife, when the hair will come freely off. Some scald their pigs in a large tub, or beer-cooler, which they utilize for the purpose, and fill with scalding water; but there is a danger of par-boiling the pig, to a certain extent, by this method, if the operation is not quickly performed; the risk of which is better avoided.

By throwing the scalding water on to the carcase as it lies on a board, or cratch, it passes off instantly, having performed the work required of it. After the hair is scraped off, the slaughtered pig should be hung up in a cool place, opened, the entrails taken out, and the carcase thoroughly cleaned.

Before the pig is killed, it should be kept without food for twenty-four hours, but should, however, be supplied with water.

Singeing.—Some persons prefer to have their hogs singed, instead of being scalded. The best method of

doing this is, after the pig has been knocked on the head, to instantly draw it to a place immediately contiguous, that has been prepared beforehand, and placed with its neck over a vessel to receive its blood, and they are stuck with the knife in the usual manner. Whilst they are bleeding, a man with a pitch-fork spreads a thin covering of dry straw on the ground—either wheat or oat-straw—which is then set fire to in the direction of the wind. Some little nicety is required to singe the whole equally, while at the same time taking care to avoid scorching any part.

The carcase will then present a dirty and blackened appearance, and this rough dirt and singed hair is scraped off, and warm water used; the scrapings and application of the water being continued till the skin is considered sufficiently cleansed, when it should be hung up and opened as described.

Cutting up.—After the carcase has been nicely cleaned, it should be hung up in a cool place for at least twelve to fifteen hours—that is, all night, and some few odd hours of the morning of the following day; but forty-eight hours is not one whit too long for it to get thoroughly cool. It should then be taken down and laid upon its back upon a strong table.

First, the head should be cut off close by the ears, and the hinder feet so far below the houghs, as not to disfigure the hams, leaving enough for them to be hung up by. After this the carcase should be divided into equal halves, up the middle of the back-bone, with a cleaning-knife and hand-mallet. Then cut the ham from the side, by the second joint of the back-bone, which will be seen on dividing the carcase, and shape the ham by paring a little off the flank, or

shinny part, so as to form it with a half-round point, clearing off at the same time any top fat that may appear.

The man who is cutting up, should next cut off the sharp edge along the back-bone with a knife and mallet, and slice off the first rib next the shoulder, where he will find a bloody vein, which must be taken away, for if left there, that part is likely to become spoilt, and the corners should be squared off when the ham is cut.

Curing Bacon and Hams.—All the necessary work for the killing and preparation of the carcase of the animal may be performed in any private house, for there are men who make a business of pig-killing, and charge but eighteenpence for doing it, and cutting up the pig; and upon a farm there is, of course, every convenience for managing the matter, and plenty of assistance at hand.

The pig having been duly cut up, each side, or "fitch," as it is now called, should receive a powdering of saltpetre, and then be covered with salt, and the same done with the hams, and all deposited in a cool place. They should lie for about a week, after which they should be turned, and salted afresh, and in two or three weeks they may be hung up to dry in the smoke-house. They may be allowed to remain a month or two before being sent to the smoke-house, if it is thought expedient; but, in the meantime, they should be looked to and occasionally turned, and have a slight rubbing-in of salt. The flitches, however, should always lie with the rind underneath, and the table should be on a slight incline, so as to allow the brine to run off them.

In Ireland they now manage matters so quickly in the preparation of what is termed "mild cured bacon," that, within ten days of the time of slaughtering the pig, the hams and bacon are ready for market.

In my own case, however, if the hams and flitches are large, we allow them to remain in salt for three weeks; and instead of merely looking to them once a week, and rubbing salt in them, my indefatigable manager inspects them every day, or every other day, and rubs in bay-salt, and coarse brown sugar in addition, which is supposed to improve their flavour. By exercising a little care in this way, and by frequent attention, we never come across a "bad place" in the bacon, and there are always half a dozen large flitches hanging up, as well as a number of hams, and both are invariably of superior quality.

When sugar is used in curing, the proportion should be one pound to three of salt, and two ounces of saltpetre. The sugar assists in preserving the meat, and renders its fibre mellow, and, as well, corrects the extreme pungency which is often occasioned by the too free use of salt.

Smoking.—In old farmhouses, where there are enormous wide chimneys, and wood is chiefly burnt for fuel, hams and bacon are often dried by hanging them up in the chimney, and where oak is burned, it is said to impart a superior flavour to them; but a very effective smoke-house can be constructed at a small expense, where the smoking can be performed in a very efficient manner, without giving scarcely any trouble, and where the operation goes on night and day.

All that is required is, to build a boarded enclosure

about 7 feet high, closed on all sides, with a small hole in the roof, so as to cause the smoke to ascend. The fire is made of sawdust, spread to the depth of five or six inches over the whole of the earthen floor, and this, when kindled, smokes without breaking out into flame. The hams and flitches should be well rubbed over with bran, and hung from the joist of the roof. We use malt-dust for this purpose, which is thought to communicate a good flavour; but malt-dust is not always procurable by many people, while bran may always be obtained. If the roof is flat, pieces of timber (or stout planks placed edgewise, which will bear a very heavy weight when so placed) should be fixed across the sides, or walls, resting upon the supports, so that their ends may hang within two-and-a-half or three feet of the floor. They may hang as thickly as possible provided they do not touch one another, and the neck of the flitch should hang downwards.

The flitches will mostly be sufficiently cured in little more than a fortnight, and they will not be found to lose much in weight; but the hams require a longer time, and may perhaps lose rather more than 15 per cent. off their weight—about one pound in six.

My smoke-house was constructed out of a few large packing cases, sent down from London empty by rail, at a cost of sixpence each for the carriage, costing besides a couple of shillings each. At certain times of the year, the London warehouses have such an accumulation of these, which bring over textile goods, and fancy goods from abroad, that their places are blocked up with them, and although they are invoiced to them at sums perhaps varying from sixteen

to thirty francs, according to their size, they are willing to sell them for a couple of shillings or half-a-crown a-piece, so as to get them out of their way.

The frame-work was formed out of a few young fir-trees from the plantation, where they were growing too thickly, using the stoutest where the greatest weight would have to be borne, as, for instance, the two end poles at top, which rest upon the upright ones at each end of the house. Upon these other fir-poles rest, upon which the flitches, &c., are hung. The outlay, excepting the cost of the labour, for this useful little erection, was only a few shillings. The boards were nailed to lap over, and gas-tarred; the gas-tar we buy at twopence per gallon at the gas-works, when we are sending the cart to our neighbouring town.

Market for Bacon and Hams.—There is always a market for first-class bacon and hams, and this is a business that may be easily carried out by anybody. The slaughtering, cutting up, salting, and smoking, can be readily managed by persons possessing only slender means and limited accommodation, and take no great outlay of money. Inferior produce stands no chance now-a-days. American pickled pork has at times been sold in Liverpool at twopence-half-penny per lb.! Large quantities appear to be sent over, and the market is sometimes glutted. It is an ill wind that blows nobody any good, and the poor at least have an opportunity of buying provisions cheap upon these occasions. But it may be said in the face of this, that such a circumstance does not offer much encouragement for persons to try their hands at rearing produce.

But this ought not by any means to be a foregone conclusion. Immense quantities of dairy produce are sent to us from America, yet in New York, and in some of the chief cities of the Union, "fancy" prices, as they are termed, are commonly realized for the highest-class dairy produce, and the best fresh butter, of what is called "tip-top" quality, fetches as much as a dollar per lb. ! This is, of course, a "fancy" price for a "fancy" article, and I do not in the least doubt, although we receive such large quantities of cheese from America, that a market might be found there for some of our finest Stiltons, Cheshire, or double Gloucester cheeses.

The competition of American produce with English, is naturally exciting serious apprehensions, but it must be ever borne in mind that there is a large market at our own doors for *provisions of the best quality* at all times.

The enormous grain supplies of the United States will always give them a great advantage in stock-feeding over English producers, but free-trade in corn is not altogether an unmixed evil for English farmers, for although it may tell heavily against the arable farmer, it enables the dairy farmer, grazier, and stock rearer to buy cheap corn for the use of their animals.

The question of feeding pigs, or shipping the grain, has been a stock question in the United States for a length of time, and the following statistics, which appeared in the *New York Bulletin* under the heading of the "Hog Crop," in 1872, may prove interesting:—

United States Hog Crop of 1872.—"From actual and estimated returns of the hog crop in the various Western States, an increase in the supply may be

expected this year, and probably for many years to come. In Iowa the number, according to an advance sheet of the State auditor's abstract of assessment for this year, is 1,244,100 head, against 1,008,671 head for 1871; and their total valuation was \$2,521,240, or \$2.02c. per head. This comparatively low average indicates that the mature hogs have been nearly all sold off, and that the stock now chiefly consists of young animals. But this difference will be soon made up by the bountiful corn crop, which is freely fed out to them. The crop in Missouri is also in a similar condition, the stock consisting mostly of young hogs, which, however, will be fully matured by the commencement of the packing season. From Ohio, Illinois, Michigan, and, in fact, in nearly all the Western and South-Western States, we have accounts of a marked increase this year, and the approaching season promises to be one of unusual activity. This increase in the hog crop is a natural result of the abundant corn-harvest this year and last. The corn product of last year was very large; so large, in fact, that the new harvest, which is even still more productive than the last, finds a considerable proportion of last year's surplus in stock, owing to the want of adequate facilities for transporting it to a market.

"The West has heretofore relied on the Southern States to take a considerable quantity of their corn surplus; but this outlet has been cut off for the last two years, for the very excellent reason that the South now not only produces enough corn to meet the demands of home consumption, but has a surplus for exportation. The foreign demand is limited partly by the high cost and scarcity of transportation, and

partly by the fact that, there is still considerable prejudice in Europe against the consumption of American corn. But the comparative deficiency in the wheat crop, nevertheless, afforded an outlet for corn which probably would not have occurred under a more bountiful year of wheat, and the corn exports of this year were on a more extensive scale than usual. As an evidence of the large yield of corn, it may be noted that the total visible supply, including stocks, in this city and the Lake ports, and in transit on the 28th of September, amounted to 13,690,784 bushels, against 7,054,000 bushels at the corresponding period last year. At present prices, and with the large supplies on hand, farmers cannot find a more profitable investment for their corn than to convert it into pork. In that form it is nearly always sure of a market, and in a more available, and less bulky form. The foreign demand for pork is almost certain to be stimulated by the growing necessities of European consumers. In England there is a slow but a certain decline in the home growth of cattle and live stock, which has already advanced the price of meat to an unusually high figure. As this increase is more likely to be augmented than to diminish, a demand will almost necessarily spring up for all kinds of American produce, which is likely to grow to very large proportions at no distant date."

The correctness of this forecast of the future has been amply proved in the very large supplies that are now sent over to us from the United States every year, yet, for all that, prime dairy-fed pork will command a long price in the home market, and the plain course before farmers is, to produce the things which

will pay them to grow and rear, and if a profit is not to be made by growing corn, to grow beef instead. As has been shown, milch-cows can be kept upon the soiling system, and there is always a remunerative market at one's own doors for dairy produce, so that men are not *obliged* to grow corn, though their grandfathers did before them, unless it will answer their purpose to do so.

Method of Curing Bacon in Wiltshire.—Wiltshire bacon is esteemed of a fine quality in the markets, that which is the most highly appreciated being prepared from dairy-fed pork, and also in the adjoining county of Somerset, being cured in a somewhat different manner to ordinary.

The flitches are laid in large wooden troughs, and sprinkled over with bay-salt; after which they are left for twenty-four hours, in order to drain off the blood, and superfluous moisture. They are then taken out and wiped thoroughly dry, and some fresh bay-salt, that has been previously heated in a frying-pan, is rubbed into the meat, until it has absorbed a considerable quantity. This is followed up for five or six days in succession, and the flitches are turned every day; and if the hog be large, they are kept in strong brine for five weeks, and turned every second day until they are hung up to dry.

Westmoreland Hams.—Westmoreland hams are celebrated for their superior flavour, and the practice in that county is to rub them very hard with bay-salt, after which they are left on a stone bench to drain off the brine. It must be premised that, the hams, in the first place, are of the best age to ensure the full, ripe flavour that is so very desirable. Four or five days

after the first hard rubbing has been given, the operation is again repeated, with an addition of about an ounce of finely-powdered saltpetre to each ham, mixed with the salt. They are then allowed to lie for about a week, and are hung up in the chimney to dry. There is a difference followed in the mode of doing this; some curers hanging them up in such a manner that they get dried entirely by the heat of the fire, without being exposed to the smoke, while others hang them up in the full current of the smoke, as it passes up the chimney (whether the fire be that arising from the use of either wood or peat), and leave them there until the weather becomes warm, when they are packed up in oat-chaff, to prevent them from being fly-blown. They are covered with paper bags, or put up in coarse linen bags.

Hampshire and Berkshire Methods.—In Hampshire, Berkshire, and neighbouring districts, they follow the singeing system; the first thing when the hog is killed being to "swale" him, or singe off the bristles; laying the carcase, as before described, on one side, and covering it thinly with straw to be lighted on the windward side, and renewed as it burns away, taking care not to scorch the skin; when one side is done, the other side is then turned, and when singed sufficiently, the bristles are scraped off dry. This is considered a better method than scraping them off with the assistance of hot water, which softens the rind, and is thought to deteriorate from the firmness of the fat.

After being cut up, the flitches are rubbed with a mixture of saltpetre and common salt, and laid in a trough, where they continue for three weeks or a month, according to their size, and during the whole

period they are frequently turned, and seen to. After this they are dried in the manner that has been described, and are packed in chaff, or put in a dry place.

The addition of sugar and bay-salt, will be found a great improvement upon using common salt alone, and it is by careful attention to a few minor particulars that a greater degree of excellence is to be obtained in the product, that so favourably contrasts with hams and bacon that have been cured at the expense of less pains and trouble.

Neither bacon nor hams should ever be kept in cellars or damp places, but be stowed away in a perfectly dry situation.

We get through a great number of hams in our household in the course of the year, particularly when green peas and broad beans first come in ; and we find the flavour of a ham to be much improved if, after it has been boiled, it is put in the *oven* for about half an hour. The slight baking it receives appears to have the effect of concentrating the juices of the ham, and of improving its flavour considerably.

Continental Practice of Stripping Off the Skin.—As the hides of pigs make capital saddles, leather bags, &c., which last for a great number of years ; in some parts of the Continent a very common plan prevails of stripping off the skin. As well as the hide being used, the bristles are made into brushes by the brush-makers, and these realize a certain amount of profit to the farmer ; while the salt is said to take better than when the skin is left on. But this method of curing does not find favour in this country, as the bacon, when deprived of the skin, becomes rusty very

often, when kept for any length of time, and also wastes in the boiling.

Pig-Styes.—The accommodation given to pigs is frequently of a very limited nature, often a mere shed attached to the wall of some out-building. The pig itself will live contentedly enough anywhere, so that it only has plenty to eat, however humble its lodging. One of the fattest, and best-looking hogs I ever saw, was kept by a cottager, who had a good garden, and made a pig-stye out of a sugar-barrel, which he had tarred well over and fixed firmly in its position, and put up a stout rough fence around it. The pig was handsomely cared for, which made ample amends for the humble residence it dwelt in; and the happy owner spent a good portion of his spare time after work hours in ministering to the bodily wants of this pig, and in complacently surveying it, leaning over the fence he had made around it. The pair were excellent friends, and a mutual attachment seemed to exist between them.

The enclosed part of a pig-stye in which the pig sleeps is generally made about four feet wide, and six feet long, and the yard six feet by eight feet. The number and position of the styes must, of course, be regulated by the number of pigs it is thought desirable to keep.

A certain nearness to the domestic offices is desirable for the convenience of carrying the wash and refuse of the house to the pigs; but the styes should not be placed near the dairy, which generally adjoins the dwelling-house, and which ought to be kept perfectly free from the risk of the slightest contamination of foul smells.

There are so many excellent examples of capital pig-styes in every part of the country, which may be readily seen, that a lengthened description will be unnecessary; but where pigs are kept upon a large scale, the styes should be so contrived that, the labour of attending upon the pigs, and giving them their food regularly, should be reduced to a *minimum*.

The pig-stye should face towards the south, as pigs are great lovers of warmth, and thrive much better where they have plenty of it. Some styes are left open in front; but although in hot weather plenty of thorough ventilation is highly desirable, yet in winter they should be boarded up, leaving only an entrance-door sufficiently large for a man to stoop under whenever it is necessary to enter the pig-stye. These boards, if placed in a groove of the framework, which can be easily made with a strip or two of wood and a few nails, can be removed at pleasure, either for the purpose of cleaning out the stye, or to make it cool and sweet upon occasions.

The uncovered part, where the animal feeds, should be boarded with a stout paling, not too high, so as to admit the sun and air. When the feeding-troughs are placed inside the stye, a plan which is more often adopted than not, it is usually put close to the outside paling, or extremity of the stye, for the convenience of pouring the contents of the pails containing the wash or food that is given to them. Where styes are already constructed, and the walls surrounding the court in which the animal feeds, are built of brick or stone, which is often the case, it is somewhat difficult to alter the arrangement; but the best mode is to place the feeding-trough *outside* the front paling

of the pen, with a hole of access just large enough to admit the head of a pig, by which means much waste will be avoided; for a good deal of food is often wasted and spilled from the pail, and perhaps dropped over the heads of the eager pigs, by careless men, in pouring the contents of the pail into the trough, and the pigs will thus feed more equally, and the stronger pigs cannot drive away the weaker ones, which they often do. The troughs also are easier filled and cleaned out, when placed outside, and are better under control.

The styes used for breeding sows, and also those where a number of store-pigs are kept together, should be somewhat wider. The trough in the breeding sow's compartment should have a sufficient number of openings for the little pigs' heads, as well as a separate trough having a larger opening for the sow, which should be sufficiently high to prevent the sucking-pigs from getting into it.

A boiling-house should be handy to the pig-styes, and water laid on if possible, it being a good plan to have a spout directed through the styes, for the purpose of their being more easily cleansed, as well as for the use of the animals; and the piggery should always be raised upon a slight declination, so as to afford sufficient drainage, and allow the urine to pass off, and keep it dry. Where this is not attended to, and the inmates not sufficiently well cleaned out and cared for, they may be often seen wallowing in filth, in which condition they will not thrive, after rainy weather their condition being often deplorable, and the job of cleaning them out often a repulsive one. Drains should be constructed from each sty, com-

municating with a cesspool, by which means a large amount of valuable liquid manure may be collected from time to time.

Where a number of pigs are reared, it will be found the best plan not only to keep those of different ages separate from each other, but even to divide those of the same litter, who are never of equal strength, and match them in size as nearly as possible, and not have more than three or four in one sty together.

The pig is accredited with being a dirty animal, but his inclination for filth has been very much exaggerated; the fact being that, when he rolls himself in the mire, it is more for the sake of cooling his skin, than relish for the mud. This is evident from the unmistakeable signs of enjoyment he manifests when scrubbed and washed; and when the pigs are served so once a week it helps very considerably to keep them in health. Heating food is very often given to pigs, which doubtless causes heat to their skins, evidenced in the fact which I have alluded to before, in the case of pigs, when fed upon beans, often having eruptions on their ears, caused by the heating nature of the food.

A method of feeding pigs has been recorded, where the styes are built in divisions each only sufficiently large to contain a pig, just allowing him barely sufficient room to turn about in. The floors of these stalls are boarded, and swept out every day, no litter being allowed, the flooring being upon an inclined plane. At one end of the stalls is a range of small troughs, which the pig reaches by putting his head through a hole, and at back is a row of sliders which shut them in, and give access to the man who cleans them out each day.

By this contrivance they are said to fatten more speedily, and consequently consume less food than when they have the opportunity of ranging about; and that hogs half fat, weighing 70 lbs., when put up into one of these stalls, may be brought to double their weight within twenty-eight days; having been known, when fed upon barley-meal and water, to increase at the rate of 15 lbs. per week.

Experiment by Lord Egremont.—In the *Sussex Report* a comparative experiment is recorded to have been made by Lord Egremont upon this principle upon some porkers, all of one breed, and as nearly as possible of the same size, but they were not weighed.

Seven of these were put up to fatten on the 25th of February, upon barley-meal, of which they were supplied with as much as they could eat; and another of the same litter, which had not been put up to fatten, on account of the smallness of his size, being much less than the others, was put into a cage, or stall, on the 4th of March, just a week afterwards, at which time he weighed 11 st. 11 lbs.

He was sulky for the first two days, and would eat nothing; but after that he came to his appetite, and from thence until the 13th of April, when they were all killed, he had just two bushels of barley-meal, with about eight bushels of potatoes, and weighed alive 18 st. 3 lbs. When slaughtered, his dead weight was 13 st. 2 lbs. (8 lbs. to the stone), and none of the other seven reached more than 12 st. 3 lbs.; the result, showing the superiority evinced by the pig that had been put up in the stall, could only have arisen from the method adopted.

CHAPTER IV.

DISEASES OF PIGS.

Surfeit and Indigestion—Inflammation of the Bowels—Diarrhoea—Colic, or Spasm of the Bowels—Inflammation of the Chest and Lungs—Catarrh—Quinsy, or Strangles—Protrusion of the Rectum—Rupture and Inflammation of the Spleen—Rheumatism—Diseases of the Urinary Organs—Diseases of the Skin—The Measles—The Murrain—Mange—Scrofula—Epidemic—Inflammation of the Brain.

THE diseases of pigs are not so numerous as those of many other animals; but, unfortunately, on the other hand, they receive so little attention, that when anything is the matter with them, frequently the complaint has made considerable progress before it has been observed, the symptoms being somewhat obscure in most cases.

Surfeit and Indigestion.—Being voracious in their appetites, whenever they have the chance they will gorge themselves with food, which brings on surfeit and indigestion, the digestive organs being very often the seat of disease.

At an early stage of surfeit, moderate abstinence will set matters to rights, allowing them to have nothing for a day or two but a warm wash, which should be of a relaxing nature, and may be composed of bran, or pollard and water, and nothing more solid

given to them. Some persons are in the habit of administering soap-suds and water in the above-named food, so as to act as a purgative; but it is better to avoid these applications, which sometimes irritate the stomach, and do away with the necessity of having recourse to any such treatment, by regular and spare feeding, so as to bring round gradually a proper condition of the digestive organs.

Inflammation of the Bowels.—Inflammation of the bowels is more often caused by unwholesome food than by any other cause, and may be either acute, or sub-acute, the pain being considerable in the former case. In sub-acute inflammation they are not so severe, but both forms of disease are very dangerous. In acute inflammation there is considerable pain without intermission, accompanied with fever and loss of appetite.

Bleeding from the vein in the inside of the fore-arm should be resorted to, the amount of blood taken away to be regulated by circumstances, from two ounces to two pounds, according to the size of the pig. If this vein cannot conveniently be opened, the tail should be cut, but merely a few drops of blood will do no service, and the bleeding must be moderately copious. Oily purgatives should be given to relax the bowels, linseed-oil being a convenient form for this purpose; and if there should be obstinate constipation, injections should be used, and warm baths are also found useful, especially in the case of little pigs.

A dose of calomel and opium combined—two, to five grains of each—will be found a useful prescription in cases of sub-acute inflammation. Where the bowels are merely constipated, and there is

reason to think no active inflammation is present, simpler relaxing medicines may be had recourse to. Doses of one scruple to a drachm of jalap, with six, to twelve grains of scammony are often used with advantage. An infusion of senna, Epsom salts, and Glauber salts, are all equally useful, but these must be administered in the form of a drench. Nothing, however, can be given with so little trouble as linseed-oil, which the pig will take of its own accord, and its operation may be increased, and quickened, by a few drops of croton oil, when the constipation is obstinate.

Diarrhœa.—*Diarrhœa* sometimes leads to inflammation, and therefore should be stopped at once. Opium and chalk are the most useful remedies to apply, and to these may be added ginger and peppermint water. The following quantities will make eight or ten doses :—

Powdered opium	.	.	.	.	.	15 grains.
Prepared chalk	.	.	.	.	.	4 drachms.
Powdered ginger	.	.	.	.	.	1 drachm.
Peppermint water	.	.	.	.	.	4 oz.

If these be divided into eight or ten parts, one or two doses per day may be given while the *diarrhœa* lasts. A purgative should be administered as well, if the *fæces* are slimy, in the shape of a dose of Epsom salts.

Colic, or Spasm of the Bowels.—*Colic* is not a very common disorder with pigs, the symptoms being those of sudden, and severe pain. Tincture of opium, and spirit of nitrous ether, in the proportions of one drachm to eight of the opium, and double the quantity of nitrous ether, according to the size of the animal,

should be given in a few ounces of warm water. If relief is not obtained from this medicine, bleeding should be resorted to without delay.

Inflammation of the Chest and Lungs.—Pigs being often put into damp, and wet quarters, or compelled to lie on wet beds, frequently are attacked by inflammation of the chest and lungs, which commonly assumes the form of either pleurisy, or bronchitis. The former may be known by the animal exhibiting symptoms of pain, while the latter is attended with cough and expectoration.

Bleeding in both cases is considered the proper treatment, though more imperatively demanded in that of pleurisy; quick breathing, fever, and loss of appetite marking these diseases. The bowels should be moderately opened, but not excessively so, and blisters may be applied to the chest. The following medicine should also be given :—

Calomel	1 to 3 grains.
Tartarised antimony	1 to 3 „
Nitre	5 to 20 „

The calomel should be omitted after one or two doses have been given.

Catarrh.—This is caused mostly by bad housing, and the same causes which make other animals subject to colds; the most prominent symptoms being a cough and discharge from the nostrils. Lodged in a good, warm, dry sty, or shed, and carefully treated, the animal will soon get well. In bad cases, the disease will extend to the lungs, and turn to bronchitis, which will require treatment as above described. In severe cases of cold, some medicine

will be useful, and the following found a good prescription :—

Antimonial powder	. . . . .	2 to 6 grains.
Nitre	. . . . .	10 to 30 „
Digitalis	. . . . .	1 to 2 „

This should be given for several days in severe cases, and the animal bled. A stimulant rubbed on the brisket will also be found of service.

Quinsy or Strangles.—Prompt treatment is called for with this disease, which generally attacks fat hogs, and if not quickly relieved, the animal dies from suffocation. The throat swells very much, the breathing and pulse being quick, while the tongue is protruded, and covered with slaver; and unless relief is afforded, gangrene will follow. Bleeding and purging, together with the administration of cooling medicines, is the most effective treatment, and setons may be inserted, and the swelling punctured.

Protrusion of the Rectum.—This is very often a fatal disease to young pigs, which are mostly attacked by it, those who are fed upon strong animal food being commonly the sufferers; town-bred pigs being more liable to the disorder than country-bred ones. It has been noticed that, where strong animal food abounding in gelatine, has been used, the pigs are most liable to this disorder. When they are roughly treated, and driven about with violence it is sometimes produced. Of course, no stock-rearers with a grain of sense, would allow their animals to be ill-used, if they knew it; but sometimes a bad-tempered man will be rougher with the animals than he ought to be, and will, at times, vent his ill-humour

upon the poor dumb beasts under his charge. The proper treatment is as follows:—The object being to return the rectum to its proper place, the pig should be kept perfectly quiet for a few days, and kept without food, except a little milk, so as to get the bowels well emptied, or as nearly as can well be, before the gut is returned. This having been done, and the pig effectually secured, the parts should be washed, and the rectum pushed carefully up some little distance. Some strong thread, doubled several times should then be passed through the anus and tied with a knot. The animal after this should be kept quiet in a clean, dry sty, for some days, and no solid food given to it of any kind, and fed mostly on milk, and it will gradually recover.

Rupture and Inflammation of the Spleen.—Rupture of the spleen is generally fatal, and it is almost useless to resort to any treatment, and the symptoms are very obscure in both cases; inflammation of the spleen being very dangerous. Bleeding and purging is the proper treatment, though the chances of a cure are very remote. The symptoms are coughing, foaming at the mouth, and grinding the teeth.

Rheumatism.—Confining pigs in cold, damp styes, and exposure to inclement weather, are the fruitful sources of rheumatism in pigs. The disease is to be prevented by wholesome dry lodging, but when attacked, the bowels should be opened with purgative medicine, and a dose of from two to five grains of colchicum given and repeated for two, or three days.

Diseases of the Urinary Organs.—Pigs are not often attacked by these diseases, which are mainly those of

inflammation of the bladder and inflammation of the kidneys. When the latter occurs, copious bleeding, a warm bath, and aperient medicines are prescribed, and the same with inflammation of the bladder, with the addition of a dose of opium to allay the irritation.

Diseases of the Skin.—Pigs are very subject to eruptive diseases of the skin, which are sometimes caused by high living, and being fed on heating food, as from the opposite effect of semi-starvation. These eruptions generally break out first at the ears, and if they are not attended to, sometimes spread over the body in cutaneous pustules, occasioning violent itching, and scabs ultimately make their appearance.

When the first symptoms appear, which will be indicated by the animals scratching themselves, a cooling lotion composed of—

Muriate of ammonia	4 drachms,
Acetic acid	1 oz.,
Water.	1 pint,

will be found a useful application, and if an ounce of sulphur and nitre is well incorporated in the food of a large hog, and given in one meal during the course of the day, it will soon bring the skin to its natural state. The disorder appears most obnoxious to the large, lop-eared breeds, the neck, as well as the ears, becoming ulcerated. In this case, an ointment made of equal parts of mutton-suet and tar, melted together over a gentle fire, mixed with a small quantity of flour of sulphur, will be found an effective preparation.

If the eruptions do not disappear under this treat-

ment, it is desirable to separate the animal from the others, and wash it thoroughly with strong soap-ley, and afterwards use an ointment composed of one ounce of the flour of sulphur, two drachms of fresh pulverised hellebore, three ounces of hog's-lard, and half an ounce of the water of kali, in the form of a salve.

Prevention, however, in this case, as in most others, is better than cure; for a pig should not be kept in such poor condition as eruptions to be caused from poorness of blood, nor be fed too lavishly upon beans, peas, and other heating food, which makes it necessary to cool the animal's system down to a proper degree.

The Measles.—This is a very common disorder amongst pigs, which, although seldom fatal, if not at once checked, affects the grain of the meat, which it causes to be of a faded colour; while the flesh presents the appearance of being punctured with small holes. The seat of the disorder is somewhere beneath the skin, throwing up externally small watery pustules of a reddish colour, with pustules under the tongue; there being also fever, cough, and discharge from the nostrils. The eruptions are more distinct after death, than during the life of the animal. Epsom salts and nitre, are the best things to give, as measles will generally yield to cooling medicine and careful feeding.

The Murrain.—The murrain is a species of leprosy—true leprosy affecting the skin, but it is luckily very rare in this country—which causes the animal to hold down its head with a staggering sort of gait, having a secretion of viscid matter issuing from the eyes, and

being troubled with shortness of breath. It arises from inflammation of the blood, mostly in hot seasons, the best preventive being to keep the animals cool. We seem to hear less of the murrain in the present age than formerly, an old-fashioned remedy being to boil together a handful of nettles, with half a pound of flour of sulphur, a quarter of a pound of elecampane, the same of pulverised aniseeds, and three ounces of liquorice, in a gallon of table-beer, the whole to form six or eight doses, and given in milk about a pint at each time.

Mange.—Mange is much less frequently met with amongst pigs than in dogs, horses, cattle, and sheep. It occasionally, however, makes its appearance, when the usual symptom of itching is manifest. Mercurial ointment, sulphur ointment, or tobacco-water well rubbed into the skin, is the proper treatment.

Scrofula.—There is, perhaps, no cure for scrofula, but preventive measures should be used. Pigs are most subject to it when they are finely bred, or bred too much "in and in." Tubercles are formed in the lungs, and in the mesentery, interfering in the latter case with the absorption of the chyle, which causes the pig to dwindle away until he at last dies.

Epidemic.—The epidemic, which is a somewhat doubtful name to use, as it is called in other animals, occasionally visits pigs, and often proves very troublesome. The symptoms are lameness in the feet, arising from soreness between the claws, and inflammation of the substance connecting the bone with the ham; so much so, that pus often forms, and the hoof is cast. An astringent should be applied to the feet, as a saturated solution of sulphate of copper, or zinc,

or the excellent application that is used to foot-rot in sheep, composed of—

Tar	8 oz.
Lard	„

first melted together, and afterwards carefully add to the mixture—

Oil of turpentine	$\frac{1}{2}$ oz.
Sulphuric acid	$\frac{1}{2}$ „

And cooling medicines should be given, as Epsom salts.

Inflammation of the Brain.—This disease sometimes attacks pigs, its presence being denoted by dulness of habit, sometimes by violent convulsions, and occasionally by blindness. Purging and blood-letting are the remedies prescribed for the disorder.

The above-named are the principal diseases to which pigs are subject, whose structure, it has been remarked before, resembles very much that of a human being, the abdominal viscera being adapted for assimilating the same kind of food that man eats, or a mixture of animal, and vegetable aliment. There is no animal that makes so much flesh, and fat, in so short a space of time as the pig; and while he will flourish, and do well upon one kind of food alone (as barley-meal), he will extract a large amount of nutritious matter from a great variety of entirely different substances.

The value of pigs as stock, cannot well be over-estimated. They form a large quantity of valuable manure, and may be kept very profitably upon those farms where there is a good deal of rough herbage of one sort or another, that may be got together for

them. Upon dairy-farms, where there is a large quantity of skimmed milk, they form no inconsiderable item of profit in the shape of young porkers, which may be fattened quickly, and sold off when very young. When breeding sows are kept, and their produce quickly disposed of, they can be made to answer admirably, and cannot well fail to be profitable under anything like the least pretension to management; and a stock can easily be got up without any great outlay in the first instance, for a sow will have her first litter when only a little over twelve months old (many have them at a year), and she has a litter every six months, so that the produce of a single sow, in point of numbers, if her progeny again was bred from, would soon be enormous.

Almost every poor man, therefore, with the necessary convenience, could commence pig-keeping; for if he had not two or three pounds to buy a breeding sow, he may begin with a young sow-pig as soon as it is weaned, and mainly keep it from the produce of his garden, and a trifling outlay per week for brewers' grains, or other cheap food, which he might be enabled to procure out of his scanty weekly earnings.

In the house of the private family, there would be nearly enough to keep a sow, or a store-pig of large size, from the refuse of the kitchen, and the "wash" and the surplus vegetables from the garden; a little extra food of a better sort to supplement it will be found amply sufficient, while the productiveness of the garden will be considerably improved by the constant supplies of manure that are always at hand ready to be dug into it.

The profuse and slovenly system upon which pigs are fed on many farms, causes it not to be a matter of surprise that pig-feeding cannot be made to pay ; but the fault lies at the door of the feeder, and is not owing to want of capability on the part of the stock to make a profit, which only requires proper handling.

CHAPTER V.

OXEN.

Oxen as draught Animals—Varieties—The Shorthorn Sale at Tortworth—Points of a good Shorthorn—Kyles, or West Highland Cattle—The Galloway—The Ayrshire—Aberdeen, Angus, and Fife Cattle—The North Devon—The Herefords—The Longhorns—The Alderney—Welsh Cattle—The Suffolk Dun.

THE chief value of oxen to the stock-keeper of the present day, lies in the marketable value of the carcase of the ox for meat; and the principal point aimed at by feeders consequently, is, to obtain a breed that will attain a large size, and reach maturity early, at as small a cost as possible.

The best breed for doing this, is unquestionably established in the improved shorthorn, which is the most profitable breed of cattle we possess; for no animal arrives so early at maturity, and few furnish meat of so excellent a quality, though the cows are not such good milkers, for the obvious reason, that the animal whose tendency is to put on flesh, cannot at the same time develop in so great a degree the opposite one of secreting milk, although some very good cows are to be met with of this breed; and it is no uncommon thing for one that has been a good milker in her day, when put up to feed, make as fine

a carcase as many animals that have never been used as dairy-cows.

Great Britain has been celebrated from the earliest times for the excellence, and variety of her breeds of cattle; embracing, as they do, varieties of very large size, down to the small breed that is met with in the Shetland isles, where the most diminutive of the known breeds of cattle is to be seen, that when fattened, scarcely excels the weight of our largest sheep, being very hardy, and admirably fitted by nature for the scanty pasturage of the storm-bound Zetlands.

Oxen as draught Animals.—Not so very long back, however, oxen were also held in estimation as draught beasts; some few counties, as Sussex, Devon, Glamorgan, and Hereford, being in possession of superior working stock, and they were considered more profitable to use than horses, inasmuch as they were maintained at a trifling cost on grass during the summer, and on straw during the winter, until the time came round, when being no longer fit for work, they were consigned to the butcher. Oxen at one time, indeed, were the only cattle employed in tillage in this country; and they are still so used to a great extent throughout the Continent of Europe. The sluggishness of the ox-team, and its uncouthness, contrasts, however, very unfavourably with the brisker horse; and the economy and convenience of a pair-horse plough has fully asserted itself over the more cumbrous team of four oxen and a driver. Yet the merits of each were well weighed years ago: Fitzherbert in his *Booke of Husbandrie*, ann. 1523, telling us that, "Therefore meseemeth, all thynges con-

sidered, the ploughe of oxen is much more profitable than the ploughe of horses."

The advantages and disadvantages of both oxen and horses have been balanced against each other in this wise :—

OXEN

Are supported at a less cost for food, farriery, and harness, are less subject to casualties, and require less attention than horses. They are more steady at heavy draught, and perform more work in proportion to what they cost per annum, and they increase in value while working, so that they are worth more at the last than at the first ; while the horse declines in value, and at length, when his days of work are over, fetches but a mere trifle, being sold for the value of his skin.

HORSES,

Although more expensive, yet do their work better and quicker. If oxen are the steadier of the two, they are also much slower, and not so well fitted to stand bad roads, or bad weather ; less tractable, less capable of making any extra exertion, and on the whole less generally useful than horses. If their increase in value is caused by their only being worked a few years and then sold, while horses are worked out and done for, yet the latter, if sold at the same age, would be the more profitable.

The very general disuse of oxen in the practice of modern farming, would appear almost to furnish an unanswerable proof of their inferiority ; and although they yet maintain their ground as beasts of draught in some counties, still the comparative merits of horses and oxen need not be discussed, for both are inferior to the steam-plough, by which the tramping upon, and "poaching" the ground is avoided ; and by which means most of the ploughing of the future will undoubtedly be done, and the suitability of the different breeds to the land upon which they are to be placed as stock is the main point to be considered.

Varieties—The Shorthorn.—About a century ago,

the original Teeswater breed of cattle, which was found on both sides of the Tees, together with a yet coarser animal in the East Riding of Yorkshire, known as the Holderness, were large, ungainly oxen (the latter the clumsier of the two), slow and unprofitable feeders for the butcher; and though with strong shoulders, were generally deficient in the fore-quarter, the meat being coarse in quality, and uninviting to the eye. The salient, and only point of value possessed by them was a large frame; but by continual and pains-taking improvement in breeding, an animal has been produced remarkable for its aptitude to fatten, and the amazing weight and maturity of carcase, to which they will attain at a very early age, as well as their symmetrical form and quiet temper, which has given them the pre-eminence over all other breeds of cattle, and has been the means of introducing them into every county in England, where the "feed" is of a sufficiently good quality for their support, rendering them more particularly suited to the rich lowlands of the kingdom.

The first improvement of this breed, or rather breeds, was due to the spirit, and technical discrimination as breeders, of the brothers Charles and Robert Colling, whose celebrated bull "Hubback," was calved in 1777, but whose own origin and pedigree is somewhat difficult to trace: this celebrated bull having been said to have been bought out of a by-lane for eighty pounds, while his descendant, "Duchess," of the seventh generation, was sold at the sale of the shorthorn herd at Tortworth, the seat of the Earl of Ducie, for the enormous sum of 600 guineas!!

As well as the Collings and Lord Ducie, there is

also a long array of names of noblemen and gentlemen who have supported and maintained the breed of Shorthorns; amongst which are to be found those of Sir C. Tempest, the Marquis of Exeter, Sir C. Knightly, Mr. Fawkes, Messrs. T. and R. Booth, Captain Barclay, of Ury, Messrs. Beaseley, Bolden, Dudding, Birkham, Torr, Topham, Ellison, Cattley, Wilkinson, and others; and later on, Lord Hill, the Duke of Devonshire, Lord Burlington, Lord Faversham, Lord Zetland, Messrs. Harvey, Combe, S. Majoribanks, Jonas Webb, and very many others, who have done excellent service in supporting this admirable breed.

The record of the Shorthorn sale at Tortworth, which was chronicled at the time by the *Agricultural Gazette*, abounds with so many interesting particulars respecting this unique breed, that it is well worth perusal after the lapse of time that has taken place since its occasion, exhibiting, as it does, the wonderful results obtained by the judicious breeding of stock, and the enormous prices realized.

"*Sale at Tortworth.*—Shorthorn breeders have hitherto dated from Charles Colling's sale, on October 11th, 1810, or from that of his brother, Mr. Robert Colling's stock, some seven years later; or, much later still, perhaps from the sale at Wiseton, of Lord Spencer's herd, on September 11th, 1846; or from the sale of the celebrated Kirklevington herd, on May 9th, 1850. These have all been great heroes in the history of the Durham breed; but none of them, it may be safely said, has exceeded in importance that which has occurred in Gloucestershire.

"We look back upon the first of these events as on

the birthday of that more general interest which now so widely prevails in the fortunes of this undoubtedly the dominant breed of cattle in this, or any other country. It was, as it were, the expiring of some patent or monopoly of immense public value, or rather the sale of it in parts to a more numerous proprietary. The result of that patent skill and perseverance exhibited for so many years by the father of Shorthorn breeders, were then distributed and scattered, and became the means, in the hands of others, of extending the improvements which he had originated. The local name became lost in the more general one, and people no longer spoke of the 'Tees-water,' but of the Shorthorn blood.

"It is curious, however, to observe that the influence of that event still exists, and that, not in the disguised or diluted form in which, after the lapse of nearly half a century, one might expect to find it, but in particular instances, as intense and definitely marked as on the day when it first made itself known. The high average price that was fetched by the stock at Tortworth last Wednesday was due, not merely to the number whose descent was traceable directly from Mr. Charles Colling's herd, but to the especial value placed upon a particular tribe descended from a particular animal in that herd.

"From 'Young Duchess,' one of the seven heifers then sold, there has descended a family bearing the name, in which the merits of the original, due to Mr. Colling, have, in the hands of Mr. Bates, and latterly of Lord Ducie, been not merely enduring, but increasing with the lapse of time, and of course with the number of the individuals inheriting them. The

original 'Duchess' fetched 183 guineas forty-two years ago, and now Duchess 59 (six years old) of the eighth generation from her, fetches 350 guineas; Duchess 64 (four years old), of the seventh generation, fetches 600 guineas; Duchess 66, also of the seventh generation (hardly three years old), fetches the extraordinary price of 700 guineas; Duchess 67, of the ninth generation (fifteen months old), fetches 350 guineas; Duchess 68, of the eighth generation (eleven months old), fetches 300 guineas; Duchess 69, of the ninth generation (five months old), fetches 400 guineas; and Duchess 70, of the eighth generation (calved about six weeks ago), fetches 310 guineas. This last was the calf of Duchess 66, so that cow and calf fetched the altogether unparalleled sum of 1,010 guineas!

"Besides these, there were also offered for sale two bulls descended from Duchess No. 1: the Duke of Gloucester (nearly three years old) sold for 650 guineas, and the fourth Duke of York (nearly seven years old) fetched 500 guineas. Excluding one cow of this family, which we have not named—as, owing to some doubts existing as to whether she would breed, she fetched but a low price—the nine animals descended from Charles Colling's Young Duchess (three of them being calves) fetched the enormous sum of 4,160 guineas, averaging 462 guineas a-piece.

"This, we need not say, is far beyond anything of which records of the breed can boast in the past; and we doubt not that it is as little likely to be paralleled in the future. The Shorthorn breed has reached its climax at Tortworth, we do not say in intrinsic merit, or in agricultural importance, but in

individual value, and as compared with that of other produce of the soil. We shall never again hear at sales, heifers and even calves started at 100 guineas, rising to 200, 300, and even 400 guineas, in successive bids, and afterwards by steps of £50 and £25 to sums of £600 and £700. We believe that enterprise and energy as great, and honour as perfect as that of the late Earl of Ducie, may, as now, hereafter characterize the profession, and no one can pay it a higher compliment than that; but it is exceedingly unlikely that the other causes which, with these, have brought about the results of the Tortworth sale, will long continue to exert an equal influence on the money value of the breed. American competition, for instance, cannot be expected to remain for ever at its present extraordinary intensity.

"We may mention as another feature of the sale, the prices obtained by the 'Oxford,' another remarkable family of Shorthorns. Oxford 6th, a cow nearly seven years old, fetched 205 guineas; Oxford 11th, four years old, 250 guineas; Oxford 15th, fourteen months old, 200 guineas; Oxford 16th, three months old, 180 guineas; and the 5th Duke of Oxford, a bull calf, five months old, fetched 300 guineas. So these five animals fetched 1,135 guineas, or 227 guineas a-piece.

"The gross amount of the sale was £9,361 16s., the number sold was 62, thus averaging about £150 19s. At Charles Colling's sale, 17 cows, 7 heifers, 5 heifer-calves, 11 bulls, and 7 bull-calves—in all, 47 animals (a smaller number, and at a time of greater agricultural excitement) were sold for £7,115 17s., averaging about £157 8s. At Robert Colling's sale, 34 cows,

17 heifers, 6 bulls, and 4 bull-calves—in all 64 animals, sold for £7,858 4s., or £128 16s. a-piece.

“Coming down to 1846, there were sold at the late Earl Spencer’s herd at Wiseton, 104 cows, heifers, and calves, and 19 bulls—in all 123; they fetched £8,468 5s., averaging £68 17s. a-piece. And Mr. Bate’s sale at Kirkleavington, of 48 cows, heifers, and calves, and 20 bulls, fetched £67 a-piece. The highest prices of which the Shorthorn breed can boast, are those of Comet, at Charles Colling’s sale, forty years ago, 1,000 guineas; and the cows Countess and Lily, at the same sale, 400 and 410 guineas respectively; at Wiseton, Exquisite, 370 guineas, and a bull-calf, 225 guineas; at Kirkleavington, Duchess 59, 210 guineas, resold on August 24th for 350 guineas; and at Tortworth the astonishing list of prices given above.

“One more comparison of the earliest and latest sales of Shorthorns may be allowed. Mr. Charles Colling sold 29 females, averaging £140 2s.; but of these 29, a number could be selected which would average upwards of £200 a-piece. The 18 bulls at Mr. Colling’s sale averaged £171 14s.; the 13 bulls at Tortworth averaged £191 18s. The totals, as we have said, represent an average price of £151 8s. over 47 head of cattle. That the latter is really a higher price than the former, may be concluded from the larger number over which it extends—the fact being that 47 of Lord Ducie’s cattle could be named which averaged upwards of £184.

“We need not add that, notwithstanding the excitement of the scene, arising from the keen competition, and the many thousand spectators of it who were

present, the prevailing feeling in the minds of many was the melancholy one, that here, at length, all that remained to represent the energy and skill which the late Earl of Ducie had brought to bear upon his agricultural pursuits was being scattered far and wide; the results of all that intelligence and enterprise which some of us had known were being sent, in many cases, literally to the ends of the earth; and, excepting in the memory of spectators, and in such records as the present, would no more collectively be connected with the name which, through them, has attained so high a place in the history of agriculture."

To me the expression of this regret appears a little misplaced, for surely the considerations referred to must have been far outweighed by the reflection, that the scattering of this fine lot of animals must have greatly benefited the country at large, and have been the means of vastly improving the quality of stock in whatever district they finally got to be located, and so tended to raise the standard of excellence of breeds of cattle throughout the kingdom.

The writer also in the *Agricultural Gazette* was wrong in supposing that such prices would never again be realized for Shorthorns, three important sales having taken place in March, 1879. The first was a sale at Berkeley, where Mr. Thornton sold a portion of the herd of Lord Fitzhardinge. Most of the animals were by the "Duke of Connaught," a bull for which Lord Hardinge gave 4,500 guineas. The highest-priced animal was a heifer of the Kirkleavington breed, which fetched 770 guineas. The young heifers of the "Wild Eyes" tribe fetched from 200 to 300

guineas. The average price of 26 cows and heifers was £165 10s.

At Kingscote, Mr. Strafford sold a portion of the herd belonging to Colonel Kingscote, M.P. The highest-priced animal was a yearling heifer of the "Oxford Belle" tribe, which was bought by Lord Fitzhardinge for 1,100 guineas. Two of the "Honey" tribe were bought for the Prince of Wales, each for 165 guineas. "Oxford Beau," a yearling bull, was bought for 675 guineas by Mr. Angus from Australia, who also bought largely at all the sales. The average for 39 cows, heifers, and calves was £93 6s.; for 9 bulls the average was £116 2s.

At Pencraig, near Ross, Mr. Thornton sold portions of the herds of the Rev. W. Holt Beaver and Mr. J. Allan Rolls. The highest-priced animal was a heifer of the "Butterfly" tribe, for which Lord Hardinge gave 305 guineas. Mr. Beaver's 19 cows and heifers realized an average of £123 18s.; Mr. Rolls' 17 cows and heifers, £83 14s.

Points of a good Shorthorn.—The head of the improved Shorthorn Durham Ox is fine, and somewhat short, but very broad across the eyes, gradually tapering to the nose, which is of a rich flesh colour, the nostrils being full and prominent, the ears being somewhat large and thin, the eyes bright and placid. The neck, which supports the head, is broad and muscular; the head itself being crowned with a curved, and somewhat flat horn. The chest is wide, deep, and projecting, with well-shaped oblique shoulders, well formed into the chine. The fore-legs are short, with the upper part very fully developed; round, deep barrel, and well ribbed up towards the loin and

hips. The back is straight from the withers to the setting on of the tail, but not long-backed from hip to chine, the hind-quarter being lengthy and well filled in.

The frame of the improved Shorthorn is considered as near perfection as possible, good judges admiring a beast that has a short back with a long frame, with a fine mellow "handle," being velvety to the touch, with a plentiful supply of soft, mossy hair, with a hide while not too thin, yet very soft. Being symmetrical in form, the Shorthorn appears a smaller animal than he really is.

The great value of the breed chiefly consists in the rapidity with which its members put on flesh, many being ready for the butcher, and slaughtered, when only two years old. When they attain form, or five years of age, it is by no means an uncommon occurrence to find steers ranging from 140 to 150 stones of 14 lbs.; £50, £60, and £70 being the prices commonly in vogue for these animals according to their size and weight, when in fit condition for the butcher.

The colour of the Shorthorn breed varies a good deal, there being a good many pure white animals amongst them, a deep, or light roan, generally called hazel, or strawberry, being perhaps the favourite; though many are partial to the rich, bright, red colour that is often seen. They thrive well in every part of Great Britain, but, like all large-sized animals, require tolerably good feed, and must not be expected to thrive upon coarse, scanty herbage; which, however, is found sufficient for the support of some of the small hardy breeds of cattle in the humid climate of North Britain and elsewhere; though the Shorthorn has succeeded

admirably in many parts of Scotland; for he possesses a good constitution in addition to his many other excellent qualities.

A cross between a Shorthorn and one of the good milk-producing breeds, as the Alderney, or Ayrshire, are valuable stock where the feed is scarcely good enough for the pure Shorthorn of large size, and some excellent cows for dairy purposes are obtained by these crosses.

Kyloes, or West Highland Cattle.—This is the prevailing breed that is found in the Highlands of Scotland, and especially in the larger Hebrides, for the climate and herbage of which they are peculiarly well adapted, though a great many of them find their way to England, whence they come in droves at certain seasons of the year, and are found extremely useful stock for eating off the grass in gentlemen's parks, and ranges of grass land where the herbage may perhaps be plentiful, but not of the best quality. Upon such "feed" they will do well and get fat; the race being contented with the coarsest pasturage, and will fatten in places where the Shorthorn could scarcely find a subsistence.

The breed arrives somewhat slowly at maturity, but his compact carcase makes splendid beef, which is greatly in request by butchers; and he is a useful animal to resort to under the special circumstances I have named, though an unsuitable one for rich pastures, where a more valuable animal may be profitably reared.

The cows give but little milk, but what little they yield is very rich in quality.

They are picturesque animals to place in a gentle-

man's park, the true West Highland ox having short muscular limbs, closely covered with shaggy hair; long, upturned horns, and a bold, erect carriage; wide and deep chest, finely arched ribs, and straight back; a bright, full eye, and noble bearing, which altogether causes him to be a very handsome animal.

The Galloway.—The Galloway is a kindred breed to the Kyloes, only polled, and with a larger frame, adapted to a better class of pasture than is necessary for the latter. Their gentle disposition and aptitude to fatten, when once they have reached maturity, causes them to be favourites with the grazier, the beef being in special request by butchers, as they cut up much better than many others; the prime parts which fetch the best price, being largely developed, so that they are specially suited for stock-cattle for the grazier and stock-keeper who sell direct to the butcher.

The Ayrshire.—The Ayrshire, on the other hand, are held in but small estimation by the grazier, the beef being coarse in quality, and the animals slow and difficult to fatten; coming but lightly to the scale when the best has been done for them. The cows as milkers take the highest rank, and are particularly well adapted for poor soils, where the herbage is of indifferent, or only medium quality. These will thrive and give an abundant supply of milk, where the larger breeds would be half starved; but, like the Alderney, this breed can be vastly improved for stock-keeping purposes, by crossing with a Shorthorn bull.

Aberdeen, Angus and Fife Cattle.—While speaking of Scotch cattle there remains to be noticed the breed which are mostly met with on the east coast

of Scotland, comprising the Aberdeen, the Angus, and the Fife breeds. These are useful animals, particularly well adapted to their respective localities; but as distinctive breeds to be imported into districts, they possess no especial recommendations, beyond making an admirable cross with the Shorthorn; which may answer the purpose of the grazier, but, it is said, not of the permanent stock-keeper, who wishes to perpetuate a distinct breed derived from any particular cross he may be aiming at, as it is asserted that the benefit ceases with the first progeny, which are succeeded afterwards by a mongrel race that are inferior in every respect to either of the breeds from which they sprang. Although this result has doubtless happened in many cases, experienced breeders assert that these consequences are owing to bad management, and from using a cross-bred bull instead of a pure Shorthorn.

The North Devon.—The North Devon have been long extensively used as draught oxen, their gentle temper, and agile carriage, especially fitting them for field labour; but they do not possess any particular qualities as stock animals for the grazier or feeder, though they excite admiration for their pleasing colour and graceful form; but they are excelled by the Shorthorn in aggregate qualities, so that they do not stand quite so highly in general estimation as they did at one time, when the particular merits of various breeds were not so conspicuous as they now are, or brought so prominently forward.

The Herefords.—In their own, and adjacent counties the Herefords bear a very high reputation as a grazing breed on rich, fertile soils, and are by many

preferred even to Shorthorns. It is no doubt an excellent breed, and one particularly well suited to its own district, being, as it were, thoroughly acclimatised and indigenous, in which case, when pretensions to rival claims are pretty equally balanced, it would *primâ facie* possess some sort of advantage over an imported breed; but in this case it is very questionable even in its own proper locality whether the Herefords are equal to the Shorthorn, which are particularly well fitted for the same description of pasture upon which the former succeed so admirably. As, however, they are seldom met with out of their native district, and even there are encroached upon by the ubiquitous Shorthorn, it is doubtful whether the partiality they have succeeded in exciting with some persons, does not arise from an unjustified preference; for they certainly do not arrive so early at maturity as the Shorthorn, which appears in this important particular to excel all others.

The Longhorns.—The Longhorns are an excellent breed of cattle, and at one time was the favourite in many of the midland counties of England, where the pasturage is mostly of a good quality. They were also liked very well in Ireland, where some of the best farmers, whose land could carry heavy beasts, preferred them to any other breed; but, although comparatively better than many other breeds of cattle, they are admittedly inferior to the Shorthorn race, and they have gradually been giving place to these universal favourites during the past fifty years, even in those districts where they used to be most highly appreciated, and where they had been brought to their highest degree of perfection.

The Alderney.—Although Alderney cows occupy such a high place in general estimation for dairy purposes, for that of the grazier they are utterly worthless.

When I first began farming, and understood but little of the various points of the different breeds, in my ignorance I put up an Alderney steer to fatten when he was about two years old. I had, at the time his dam was served by our Squire's Alderney bull, but a couple of Alderney cows, if I remember rightly, and this was the only one that had been so arranged for, all the others having been crossed by a capital Shorthorn bull owned by a neighbouring farmer. My memory may not serve me quite correctly, but I think we were about a year fattening this unlucky steer, and the quantity of turnips and hay he consumed was something really enormous in the long space of time we were operating upon him. He was a nice gentle creature, with a placid eye and contented disposition, with a soft silky coat; but he seemed as if he never would get fat, and when I finally sold him to the butcher, there was a considerable loss made upon him.

In the first place it is a bad plan in most cases to put up an animal too early to fatten, before his system is, as it were, thoroughly established; and herein lies the great excellence of the Shorthorn breed, which will begin to put on flesh rapidly at a very early age. In this particular instance, the animal turned out far better for the butcher than he anticipated when buying it; and this is doubtless always the case with Alderneys, to those who are not in the habit of purchasing them, and who form their estimate of an

animal's value by the ordinary rules, and apparent appearance presented by the beast they are treating for.

The man I sold him to was our own butcher—a very fair-dealing man—and he sent me word after the beast was slaughtered that he “cut up” a great deal better than he expected, and in consequence I might have as many joints from him as I might care to order for the ordinary use of my household at half the usual price. I refused the offer; for although many people seem to eat their own produce in the shape of live stock with an extra relish, I can never get over a certain repugnance I have to eat any portion of an animal, or even a fowl, that I have been accustomed to look upon while alive, and with whose peculiar idiosyncrasies I am acquainted, from the interest I take in them, as it seems to me almost like an act of cannibalism, that of eating up one's dumb companions. I have often been laughed at for my squeamishness, as it is generally termed; but, nevertheless, I have found it impossible to get over the dislike I feel in this way.

I have spoken of the placid disposition of the steer I have referred to, because it is well known to all dealers in cattle that, although a lot of beasts of the same breed and age may be bought off one farm, and be as near alike as can be, yet they will not be all found to feed alike, some consuming more food with a less aptitude to fatten than others. This arises, in fact, from the nature of the animal, and often proceeds from difference of temper: some being more restless and unruly than others; so that an ox with a gentle, kindly disposition is much more profitable to feed

than a bad-tempered one. Early maturity as well depends upon superiority of breed; but of this I will treat hereafter, as I am now merely recording my experience with an Alderney, and the same result has been experienced by others no doubt, who, like me, were not sufficiently acquainted with the business in hand, and have chosen such an unpromising breed to experiment upon; and as early maturity belongs in a superior degree to Shorthorns, it is evidently prudent to confine fattening cattle to this head in preference to any other, under appropriate conditions, though Highland cattle will fatten well upon grass and turnips, and will often answer the grazier's purpose better than any other breed that may require large quantities of hay (which is expensive), as well as oil-cake.

Welsh Cattle.—Some of the Welsh cattle possess features remarkably like Highland stock, and are indebted, like them, for their peculiar features to diversity of soil and climate. The Pembrokes may be said to represent the mountain breeds, being very hardy, and thriving in a humid climate, which would be quite unfitted for some of the larger sorts which do so well in the midland counties of England, most of them being black in colour, with deep orange in those parts that are nearly destitute of hair; and they occupy the same sort of relationship to the mountain breeds of Wales, that Argyleshire do to those of the Scottish Highlands.

And thus the Anglesea cattle are heavier and coarser than the Pembrokes, while those of Merioneth, and various mountain districts, are both a smaller and inferior race. In the more fertile parts of South

Wales, Herefords used to be commonly kept, and these are now found there, as also the Shorthorns, besides the Glamorgan breed which is chiefly found in the county of that name, which, although it includes the iron districts of Aberdare, Merthyr Tydfil, Dowlais, and similar mountainous tracts, yet also embraces many fertile areas and grass farms, suitable for dairying business, for which this breed is well adapted.

The Suffolk Dun.—Suffolk has always been famous for its dairy produce, and the Suffolk Dun,—a polled breed, the prevailing colour of which used to be a sort of mouse-dun, which has given way latterly to that of a pale red,—has long been a favourite breed in that county, to which it appears to be almost indigenous; but they are not at all fitted for the purpose of the grazier, their chief value consisting in the large amount of milk yielded by the cows in proportion to the food they consume, the cattle being somewhat ungainly in their form. Since, however, the great extension of the turnip husbandry in the counties of Suffolk and Norfolk, and the development of the excellencies of the Shorthorn race—which are now appreciated everywhere on account of their combined usefulness, both for the dairy and the fattening-stall—the native breed is gradually receding before them, in the same way that the Longhorns and Herefords are doing in the counties where they also used to be so highly prized.

The various breeds enumerated above, comprise the most valuable, and useful kinds of stock that are generally chosen by the grazier, and stock-keeper; as well as those which, unfitted for being profitably converted into fat oxen, yet are desirable as cows for the dairy.

I have not mentioned the Sussex breed, of which there are two—a light and a heavy breed, the latter once prized as a draught ox, being a strong and powerful worker, of a very quiet and domestic temper, and so steady a puller that he will draw nearly, or quite as great a weight as almost any horse that bears any degree of comparison with him as to size.

He is, however, a slow feeder, and though by no means a bad animal for fattening,—for when only moderately fattened, his weight will average 130 to 160 stone,—he is inferior to the improved Shorthorns, which, in brief, nothing can be found to excel. Besides the slowness of the growth of the Sussex breed, they carry too great a proportion of their weight on their coarser parts, a similar defect being also attributed to the Hereford breed.

CHAPTER VI.

OXEN (*continued*).

Cattle-sheds, Cow-houses, Boxes, &c.—Hammels and Shelter Sheds—
Cattle-sheds, Shippons, or Byres—Cattle-boxes—Breeding—Feeding—
Straw as Food for Stock—The Practice and Experience of
Messrs. A. Jemmett, R. Valentine, E. J. Bullen, G. Neale, G. T.
Wright, T. Duckham, and C. Randell.

Cattle-sheds, Cow-houses, Boxes, &c.—The breed of cattle having been decided upon that is most likely to answer the purpose of the grazier, or stock-keeper, in accordance with the nature, and the quality of the land he occupies, which, in the case of a humid climate and coarse pasturage, will be best found in some of the smaller, and harder breeds above described, and in that of rich pasture-land, or where the intention is to feed largely upon roots, oil-cake, etc., upon the soiling system, in the improved Shorthorn breed—the next matter to be considered is the effectual housing of the animals, in the manner most conducive to their health and comfort, as well as with an eye to the economical aspect of the question; for it is an undoubted fact that, a considerable quantity of the food consumed by warm-blooded animals is expended in maintaining the natural heat of their bodies. This principle admitted and recognised, it will be apparent that, when cattle are

exposed to too low a temperature, either their progress must be retarded, by a great proportion of the food they consume being expended in keeping up the animal system, or a great additional expenditure must be incurred ; and if well housed, they will both eat less, and lay on more fat.

It has taken a long while to get this principle fully acknowledged by many uneducated farmers, while, unfortunately, even at the present day, there are a great number who do not so fully appreciate the point as they ought to do, for their own interests. Many years ago, in the *Sussex Report*, the principle was enunciated that, "in proportion as the cold is excluded will the ox get fat ; warmth being almost as essential as food itself. The more cattle are confined, the sooner also will they fatten ; and this holds good with every species of live stock upon which experiments have reached us."

Arthur Young instances two cases where this principle was carried out to such an extraordinary extent that, in the case of Mr. Moody of Retford, who was an uncommonly successful grazier, and who looked upon warmth as of such vital consequence that he gradually closed the air-holes of his ox-house, which was purposely provided with sliders, till the beasts sweated off the hair, nor did they thrive to his mind till this happened.

Notwithstanding, however, the success of some persons who may have followed out this method to the fullest extent, unless very nicely managed, and regulated upon an intelligent, and proper system, in many cases it would be quite possible to produce an entirely different effect, and the animals being

kept too hot, would make them perspire, and occasion their skins to itch, and so produce a condition of unquiet and restlessness, and cause them to be occupied in rubbing themselves instead of lying quietly down, which is very conducive to quick feeding.

The obtuseness of farmers in an earlier generation, at the time he was devoting such persevering attention to the subject of improvements in the practice of agriculture, excited the ire of Arthur Young, which provoked him to say that, "men farm without an idea of the necessity of knowing what others have done before them; and that it is very right that thousands of pounds should have been lost by oil-cake, while feeding shivering beasts in open sheds, by men who think they can learn nothing beyond the practice of the old women, their grandmothers, while the Board of Agriculture has annually brought to light in County Reports practices unknown to the same men who cannot see any use in such publications."

This principle, therefore, ought to exercise a considerable influence in guiding the stock-keeper to a satisfactory solution of the question that is even now so much debated, as to whether yards, stalls, or boxes, are best adapted for the fattening of cattle. With open sheds the firmness and flavour of the flesh of the beasts is doubtless superior, but where warmth is better secured, the *profit* upon feeding transactions will be much greater.

The smallest amount of litter is required in stalls, and they occupy the least space, and are more likely to be too warm than too cold, but the cattle are deprived of needful exercise and require more attendance, though upon this principle pigs would fatten the

quickest of any. Yards present the greatest facilities for converting straw into manure, but this is often done to too great an extent, and straw wasted that might form a considerable portion of the food of the beasts on a farm, about which I shall say a word or two further on, under the head of "Feeding." The cattle when kept in yards require the least attendance, and look best when brought to market, but both the cattle and the manure suffer from exposure to the weather.

Boxes, which are decidedly the best method of feeding cattle in, combine to a considerable degree the advantages of both these plans, which may be briefly enumerated as keeping their inmates safe from cold or disturbance, enables them to have moderate exercise, while less attendance is required than when they are confined in stalls; less litter is needed for them than when kept in yards, while the manure that is made under them, being shielded from the weather, and retaining its volatile parts contained in the urine, is superior in quality to that produced by the other methods.

Another excellent plan consists in roofing over the entire yard, so as to protect the cattle, the food, and the manure, from the vicissitudes and changes of the weather. Under this system the cattle are tied up for each meal and loosened after it is despatched, by which means they feed quietly and undisturbed, and yet get enough exercise.

These arrangements are often objected to on the score of the *trouble*, and extra labour incurred; but I cannot insist too much upon the principle which is ever before me that, when these tasks are part of a

defined system, and a matter of *routine*, the frequency of their occurrence makes them a matter of habit, and they are performed with astonishing rapidity by practised hands.

After a few lessons the cattle soon get to know their own places, and allow themselves to be tied up with willingness, knowing what is in store for them; and where this has been continuously done upon a large scale, it has been found that two men can unloose a hundred beasts in ten minutes, and tie them up again in twenty. This would seem almost an impossibility to those who have never seen it done, but it is a simple record of actual experience.

Where a choice exists, boxes are to be preferred, but it sometimes happens that a person may not have the opportunity of choosing for himself, but must rest contented with the appliances at hand which have already been provided; but where new buildings are to be erected, or already existing ones may be converted into boxes, it will be found of advantage to have at least a portion of the buildings based upon this arrangement.

In the *Sussex Report* it is recorded that Mr. Ellman, of Glynde, found as the result of his experiments with feeding oxen, that nine animals fed loose in a yard, by what they ate, as well as partially destroyed, consumed as much as twelve oxen did when tied up; so that 25 per cent. of an animal's food was saved by the plan of tying.

When cattle are fed loose, a certain amount of waste cannot very well be avoided, as much of it is so trodden under foot, and dirtied, as not really to be fit to be used as food, and can only be thrown upon the

dung-hill. But, on the other hand, where stall-fed, the refuse will do very well to go to the lean stock, a few of which might always be kept adjacent to the stall-fed cattle for the purpose of eating up this *residuum*.

In some parts where stall-feeding is practised, the stalls are nine feet wide, two beasts standing together in each. Sheds are constructed for loose cattle, with separate yards communicating, in which two are confined alone, this being considered the preferable method, as the oxen are more secure from interruption by other stock, and while together, instead of being single, they enjoy the gratification of association which is well known to have a beneficial influence upon all animals, which, when accompanied by quietude, causes them to thrive better than when alone.

When a number of animals are penned up together, it uniformly happens that the oldest and strongest take possession of the crib, and keep it till their appetites are satisfied, to the exclusion of the weakest, who actually stand in the most need of abundant feeding, and are thus kept till the last.

Not only do accidents frequently occur, but contention amongst the animals causes waste. Although it may be said that, by giving an ample supply, all will at length be served, and have enough, yet those which are kept back are made to fret, from being thrown off their regular feeding.

A greater degree of comfort is procured under warm buildings, even if these should only consist of loose sheds; and the bullocks will carry a better coat, which causes them to *appear* in finer condition if they really are not more so than others differently treated.

But cattle are always tamer when tied up, than when kept loose. When any disturbance occurs in a yard, a loose bullock will rise and fly from it; while, when tied up, he knows he has not the power of doing so, and lies still, and chews his cud.

At first, when cattle are tied up, if a bullock has not been accustomed to be handled, he will have great reluctance to enter a stall; and turnips or any food to which he has been accustomed should be thrown into the manger to induce him. He will like still less the idea of being haltered to the stake, and he needs to be very gently, yet quietly and firmly handled. He should at first be rather tightly fastened, to prevent him from attempting to get loose, or turn round in his stall, which he will be sure to try to do when he finds himself fast. He needs, therefore, at first, to be attentively watched, in order to prevent accidents, until he becomes reconciled to the restraint put upon him, when the chain may be loosened somewhat.

The common methods followed in the housing of stock is, first, in the case of young stock; when a shed is provided for shelter in a large yard, in which they are fed, and roam about. But in the case when animals are put up to fatten, the yard is only made sufficiently large for two, or, at most, three beasts; while the shed is of corresponding size. The second method is, where the bullock is tied up in a stall in a stable, or *byre*; and the third plan is that, as before described, where, in lieu of a stall, a box of about nine feet square is assigned to each beast, in a covered building in which he is not tied, but has liberty to move about.

This is termed *box-feeding*, and finds the most favour with stock-keepers—especially those who attach great importance to the quality of the manure they make.

Under the method of the sheltered shed and yard, the cattle consume their straw and roots, and are littered down; the manure being allowed to accumulate until the cattle are turned out, when the yard is emptied and cleaned out. In the yard and shed, called a “hammel,” or “hemel,” made only large enough for two, the cattle are supplied with litter two or three times a week in the shed; and this, as it gets soiled, is thrown out into the yard, where it accumulates. In stall-feeding, which is not considered so good a plan as either the hammel, or box-feeding system, fresh litter is supplied to the beasts every morning, when the wet litter and dung are removed into the yard.

Upon the box-feeding principle, fresh litter is given to the animal every morning; but this is *not* removed when wet, but as the dung accumulates. The animal, by standing on it, treads it into a compact mass, which effectually stops the fermentation that would otherwise ensue; and this is not removed until the beasts leave the boxes for good.

Hammels and Shelter-sheds.—By the method of shelter-sheds and hammels, the arrangement is precisely the same as in sheds and yards, except as regards size; the latter being suitable for the accommodation of a large number of cattle, while the hammels are only intended for two, or, at most, three beasts.

For the accommodation of ten beasts when kept in yard and shed, the shed is never less than fifteen

feet wide, and a length of forty feet would be required: the yard needs to be forty by fifty feet. In sheltered situations, this rule for dimensions is found sufficient; but where it is exposed, it will be desirable to give more shed-room, and lessen the amount of yard-room; or better still, to cover over the whole area of the yard with a light roofing of corrugated iron, by which the manure will be protected from the rain. The shed should be more or less open, according to the necessity for shelter or otherwise. In a warm, and sheltered position, if the roof is merely supported by pillars in front, that will be found sufficient; but if in an exposed one, a wall will be better, with two or three openings for the admission of the cattle, more openings than one being found necessary in the case of an unruly animal, which will otherwise drive the others about, and disturb their comfort and quiet. These openings should be seven feet high, so as to allow of the easy entrance of the animal, as the dung accumulates in the shed and yard; and they require to be from five to seven feet in width. The angles of the jambs of the openings should always be rounded, to prevent the animals chafing themselves against sharp edges. These entrances, as they are without doors, are sufficient for the purpose of ventilation, and no other need be provided. The floor of the shed should be formed in the same way as that of a stable; and the same provision made for draining off the liquid manure.

The yard, also, should be made with a slightly concave surface, and in the bottom of the hollow an eye communicating with the main drain should be placed, and the walls should be six feet high above the

surface, to allow for the accumulation of the litter, which will considerably raise up the original level. Two strong gates should be provided so as to allow of the cart to be driven in and out when the dung is being taken away, and the feeding trough is placed along the most convenient side of the wall of the yard. At intervals of eight or nine feet along the front of the trough, stone, or iron posts are sunk into the ground, and built into the stone, or brickwork, standing up about eight or nine inches, and that part of them is grooved in its opposite sides in the direction of the length of the trough. Into these grooves planks are slipped, about seven by two-and-a-half inches, to form the front of the trough, so that when no cattle are in the yards, the planks can be removed and stored away. It is usual to make a number of small openings in the wall for the purpose of supplying the troughs with turnips and other food, which are either simple openings, closed by hinged shutters, or funnel-like shoots of smooth stone, built up with the wall.

In some convenient place in the yard, a trough for the supply of water should be placed, where the cattle can help themselves to water when they need it.

As before remarked, hammels are constructed upon the same principle as yards and sheds, only of smaller dimensions; the shed being narrower, and longer in proportion, in order to get sufficient width in the yard, which is of limited extent, as in feeding too much yard-space is undesirable. Fifteen feet will be enough for the yard in length, by eighteen or twenty deep, and the shed fifteen feet long and twelve feet wide. As there is no room for a straw rack to be

placed in the yard of the hammel, a moveable rack resembling a stable rack is hung up against the wall, and raised from time to time as the dung accumulates.

All the sheds should be spouted, so that the rain-water can be carried away in drop-spouts to a rain-water tank, separate from the liquid-manure tank. The rain-water will be useful, and can be pumped up from the tank provided for its reception when required for use; and, keeping it away from the manure, it will not wash half its goodness away, which is commonly the case when there are no gutters to the eaves of the sheds.

Cattle sheds, shippens, or byres.—The best form in which this principle of feeding is carried out, is when the building has a platform upon which the animals stand, this being divided into stalls by low partitions. Running along the head of the stall there is a trough, or manger, and also a rack for the food. There is a passage for the convenience of supplying the food along the head of the stalls, and another at the opposite side for the purpose of taking away the litter.

In order to avoid the constant trouble of bringing in the food for the supply of the animals at each meal, it is found a good plan to have a food-bin extending the whole length of the building, which can be filled directly by the carts outside, and the turnips and mangolds, or other roots, stored, which then have only to be lifted from it across the gangway into the troughs, and less labour is incurred in the feeding, when done in this manner, than by any other method.

Ventilation is provided for as in stables, and the flooring of the stall, and the passage behind, should be impervious to moisture, and the gutter should not be more than three or four inches deep, and made of smooth stone, or cast iron; or if neither of these materials is handy, then of brick, but the latter is more pervious than the others. Upon the different merits of sparred and other floors, which are now engaging a good deal of attention, it is not necessary to speak in this place, as the subject requires to be treated upon in detail.

In the method of stall, or box-feeding, the general form of the buildings is not of so much importance, so that the necessary work can be carried on upon such a principle of arrangement as will save as much labour as possible.

Cattle boxes.—Another method is to feed stock in boxes, in which the beasts are penned up, but not tied, the boxes being about ten feet square. This system is the one most in favour of late years amongst agriculturists who are the most successful stock-keepers. The box is formed either by excavating its area to a depth of two or three feet below the usual level of the floor, or by building a wall to form a pit about three feet in depth, and enclosing it by railed partitions. The litter is allowed to accumulate in the area so formed, and by the animal treading on it continually, it is pressed into a compact mass, so that its ammoniacal properties do not evaporate, and a large amount of valuable manure is thus made, which represents an increased amount of fertility of the soil upon which it is laid.

As the litter accumulates, the level of the floor will

necessarily be raised, the increase in height depending of course upon the quantity of straw supplied, the rate of increase being about nine inches a month with a liberal supply of litter. The boxes are arranged in a roofed building, with passages between the rows for the men to pass up and down when attending to the animals. The floor of each box should be slightly dished, and an eye-stone placed in the centre, to carry off the surplus moisture into the manure-drain.

Breeding.—The subject of breeding has been treated upon pretty fully under the head of calf-rearing, but there is a certain commercial aspect that requires to be borne in mind by those who breed for profit; the object being to obtain animals which will make the largest return in the shortest time upon the consumption of a certain quantity of food.

The main result will chiefly depend upon the selection of the bull, as the qualities of the progeny are mostly influenced by the male parent, and the more certain characteristics are concentrated in him that are desired to be found in his offspring, the more certain will be the wished-for result; and the greater likelihood of obtaining a lot of calves of uniform quality. Where there is a dairy, and new cows are constantly coming in to take the place of the least profitable ones that are weeded out, either on account of age, or any other cause, a certain amount of alien blood will be introduced, to do away with the too close ties of consanguinity that may be gradually growing up in the herd.

Pedigreed bulls are of far more value than is generally supposed, and are much to be preferred to a chance animal derived from no particular parentage,

but which may happen to be possessed of all the best points that are looked for in his own particular instance. The concentrated qualities that are developed in the individual, are more likely to be perpetuated when they are hereditary in the family from which he sprang; while in the case of an animal that is indebted for his personal excellence to but one good descent, the progeny will very likely betray the inferiority of the more remote parentage. Men may frequently be heard to declare that they do not value pedigree a jot, and are content to trust to their own judgment; but where a bull comes from a herd in which excellence has long been hereditary, there is a fair certainty of the same amount of excellence being shared in by the progeny.

As to the breeding of bulls, the ordinary farmer, or grazier, will find it answer his purpose to confine his attention to the production of useful stock, and leave the breeding of bulls to those who have capital, skill, and leisure to direct to this special department of stock-keeping; which is best left in the hands of noblemen and gentlemen who pursue it more with a view to the credit and renown they obtain, and the laudable ambition of improving the breed of a county, or district, for the benefit of their friends and neighbours, rather than for the pounds, shillings, and pence that are to be obtained by their transactions.

Too highly-bred cows are very often not only poor milkers but unsafe breeders, and less refined ones will invariably suit the purpose of the breeder better than the more valuable animals in point of descent, who usually do no more than bring up their own calf, and are not always able to do that; while

good ordinary cows will nurse at least three calves each, and sometimes even five, and by the use of a good pedigree bull, although they may be of inferior quality, (for often the ugliest, and most ungainly in the herd is the best milker,) a very uniform lot of calves may be obtained, although a great difference may exist amongst the cows themselves, small Ayrshire cows often dropping the largest, and heaviest animals when they have attained their full maturity and have been finally fattened, when crossed by a superior Shorthorn bull.

It will be found the most advantageous plan to have the cows calve as much as possible during the first three months of the year. Not only are the calves usually the most vigorous, but they are fit for being turned out when the grass is ready to receive them, and thus they will be enabled to run all through the summer and autumn, building up their strength, till November comes round in the usual course of the seasons, by which time they will have become strong animals, that have been reared up at a small expense, quite capable of standing the winter, and roughing it upon hard fare, which would be unsuitable for delicate animals, that would have to be fed at a much greater expense to their owner, and so be less profitable stock; and it is by paying attention to these points that profits are augmented.

Cows should be allowed to be dry for three months before calving, the rest promoting the growth of the foetus, and invigorating their constitutions, and by husbanding the cow's animal resources a full supply of milk is ensured when she calves, though there are exceptional cases of cows with such vigorous consti-

tutions that there is a difficulty in drying them at all.

In the long run, where the quality of stock is a consideration, and the calves are not sold off immediately they are born, which is the practice in some instances where milk is the chief object sought for, it will be found most profitable not to allow the cows to have their first calf until they are three years old. Although two-year-old animals often do very well when they are liberally kept, the general health and vigour of the herd will be better in those cases where this rule is observed.

Feeding.—All animals, to do well, must be sufficiently fed, but the ox, on account of the vast space devoted to his digestive organs, must have a very large quantity of food to supply them; and being provided with a complicated viscera, his stomachs being four in number, he is enabled to extract a larger amount of nutriment than most other animals from any given quantity of food by the elaborate apparatus he possesses; but before this is set in full working order, the rumen, or first stomach, must be filled, which is capable of containing, comparatively with the horse for instance, a very large quantity.

One of the most important questions of the day, as affecting stock-keeping economy, is the use of straw for feeding beasts, and a valuable contribution has been made to our stock of knowledge upon this subject by Mr. Joseph Darby, whose paper in the *Journal of the Royal Agricultural Society* is a most important one, on account of the various examples that are given of the different experiences of a great

number of individuals who have largely resorted to the use of straw-chaff as an adjunct in feeding.

The waste of straw in uncovered yards, in the shape of spoilt manure, is very appropriately pointed out, in many of the examples that are quoted, by those who turn their straw to a more profitable account.

Mr. Alexander Jemmett, of Binfield, Berks, attributes wholly to the want of covered yards and other conveniences the fact that, straw is not more generally utilized as food; and the extent to which it is employed in this manner, in cases where there is perfect accommodation, such as at Havering Park, Tip-tree, and Esrick, goes far to support this view.

Straw as Food for Stock.—Mr. Jemmett says :—“Under existing circumstances, the greater portion of straw grown on the farms, is wasted in soaking up pools of water in yards with the minimum amount of spoutless shedding, and receiving the water from barns, and adjacent buildings. This is a serious evil, requiring the attention of owners, as tenants are compelled to consume hay, straw, and roots, on the premises. Straw is not used for food to the extent it would be with better arrangement of buildings. Covered yards, and properly constructed pavements, would effect a great saving in straw used for litter; and stock might be increased about 30 per cent. were more straw used as food. I employ straw chaffed, mixed with hay, &c. Steaming and other methods of enhancing its feeding value would, no doubt, be followed out, were better accommodation afforded.”

Mr. R. Vallentine, of Leighton Buzzard, Beds, also animadvertes on the same subject. This gentleman says :—

"On arable farms, most of the straw produced is consumed in litter in large open yards, which in wet periods, allow a large quantity of liquid manure to run from them, generally as waste ; neither tanks, nor any other provision being made to utilize the drainage. I know that a very large number of farm premises are so situated that, the liquid manure might be easily allowed to flow upon grass-land adjoining, and be so distributed by open gutters, that some acres might be easily manured with what is usually wasted. Covered yards, or more house room, is very much required on most farms, for the better accommodation of cattle. There would thus be a saving of food, of litter, and of manure ; and a faster increase of the animals in condition, by being kept both warm and dry. Every practical farmer knows this well, still the individual, and great national loss endures from generation to generation."

Mr. E. J. Bullen, Norwood Farm, Southwell, Notts, alludes to the extensive employment of straw in his district as food for cattle :—

"At a rough guess I should say that from one-fourth to one-third of the straw is eaten, the rest used for litter. I give it to horses and cattle, supplemented by corn, turnips, and cake, according to the class of stock, as much as they will eat. I cut it into chaff for the horses, and mix it with corn, &c., in the manger ; for cattle, I also cut it into chaff, and mix with pulped roots, but do not let it ferment. Generally cattle do better on straw cut into long chaff ; horses require it short. Last winter I used most of my straw as food for cattle ; as I had very little hay, the straw was cut into chaff two or three inches long,

and was mixed with pulped mangold-wurtzel, with more or less cake, or other feeding stuffs. I can strongly recommend sparred floors; I have tried them on a small scale, and find that they answer uncommonly well. If sparred floors were used instead of straw litter, and the straw thus saved used for fodder, cattle might be doubled in number. I should say in such a case it would be desirable to make less hay, but this would depend on the circumstance whether the hay was wanted to cut up with the straw, or whether roots or some other green crop were used. Mr. Jonas's system has not been adopted here. Pulping supplies that want, and very few farmers have either the old straw to cut up, or storage room for a lot of chaff."

Mr. G. Neale, of Newfield, Notts, says:—

"As your queries are of great importance, I have great pleasure in answering them. I believe two-thirds of the straw in this district is used as litter. We give straw to fodder the cattle in open yards, and in this way an extravagant waste takes place. The only part we utilize properly is the chaff, which we separate at the time of threshing, and mix it with chaffed fodder for horses; we also give it to the milking beasts mixed with meal in a dry state. When using chaff, or cut-straw for horses, I consider it desirable to moisten the food with cake-water, or linseed soaked in water, and also to use a little bran. Cattle living partly on roots will not experience any ill effect from the dry food. Many farmers, where roots are plentiful, use nothing but straw and roots for wintering store-stock. In other circumstances, half a cake per beast per day is sometimes given with

straw. As to the economy of litter, I am afraid we can find nothing to act as a perfect substitute for straw. What, then, can be done to make straw go further and encourage farmers to make more use of it as a food instead of carting so much from the yard to the fields in a state of sodden litter? My idea of the situation, and the most practical method I can see of utilising and economising straw, is, to have covered-in yards, which I feel convinced, if generally adopted, would enable us to consume two-thirds of the straw as food; the remainder would take the place of the larger proportion under the old system of open yards, and serve under the covered yards as litter. I have no experience about littering boxes with cut-straw, but imagine that, owing to the expense of preparation, there is no economy to be gained.

“My experience of the use of straw as a food, and where I attach to it the greatest value, is in special and emergent cases. In 1868 I began farming near Mansfield, upon a sheep-farm. My turnip-crop that year was almost a total failure as regards the main crop; we did not raise a crop of late common turnips, and could not spare any for the cattle in the yards. Nearly the whole of the barley I grew was fit only for feed purposes. I had taken (fixed in the buildings) a steam-power six-horse threshing-machine, including grinding-fixture and chaff-cutter; under these combined circumstances I thought it best to consume the inferior barley on the place, instead of buying other food. The barley we ground, and the straw we cut into chaff as we wanted it, but did not give it to the cattle in a dry state. I had a copper fixed, and a large stone trough placed by the side of it. My plan

was to boil linseed, 1 lb. per head per day, for two-year-old heifers. When it was mixed, a layer of chaff was first placed in the trough, and scalding liquid thrown over it, then turned over. On this was placed a quantity of meal, and so on. I gave 3 lbs. of barley-meal per head. I can only say the plan answered all my expectations, and my cattle never did so well as when treated in this way."

Mr. G. T. Wright, Stokes Farm, Wokingham, in speaking of Mr. Jonas's method of improving straw-fodder, remarks that, he remembers the time when great heaps of chaff and cavings as it came from the threshing-machine, were left to rot on the ground, whilst the cart-horses were often short of food. He says, speaking of improving straw fodder:—

"I have tried it several times, and find it very useful. It seems to me, the great secret in preparing it is to have it thoroughly well trodden down into its store place; then it comes out with a smell like new hay, and is much relished by stock. I am not aware of its having been tried on other farms near here. During the last few years much more care has been taken to utilise all the produce of the farm. Some seventeen or eighteen years ago, when in a farm near Bristol, I saw great heaps of chaff and cavings as it came from the threshing-machine left to rot, or carted on to the grass grounds, whilst the cart-horses were often short of food. Now, this is all carefully stored, and is very useful food in winter.

"I grew this season thirty-four acres of wheat, twenty-three acres of oats, and sixteen of barley. I expect to use the whole of the oat and barley-straw, and quite one-third of the wheat for fodder. I think

not very many in this district use so large a proportion. But its feeding value is becoming more known. I have used it for horses and cattle, but not for sheep. My cattle get their chaff mixed with pulped roots, grains, or meal. Horses have it damped, and mixed with crushed oats and maize."

Mr. T. Duckham, of Baysham Court, Ross, the editor of the *Hereford Herd-Book*, is of opinion that straw might be much more extensively employed in feeding cattle in conjunction with richer food. He says:—

"Certain remarks which I made, in a paper read before the Breconshire Chamber of Agriculture in 1869, apply directly to your questions, and I cannot do better than reiterate them. The food for fattening-stock should be occasionally changed. My system is an allowance of best quality linseed-cake, from 3 lbs. to 5 lbs., given the first thing in the morning, and followed by three feeds during the day, of chaff, meal, and pulped roots, and a little hay in the rack at night. I like to reduce all corn to a fine meal, and mix it with the chaff and pulped roots, twelve hours before using, when a slight fermentation will take place. That animals, like ourselves, are fond of a change of diet may be readily conceived by the eager manner in which they will frequently eat their litter when fresh. The year 1864 was one of great trial to the stock-owner: the short supply of hay and failing crop of roots rendered it impossible to carry out my usual system; but the low price of corn and prospect of high prices for beef induced me to substitute straw for hay, and, in the absence of roots, to make linseed-tea, which was applied boiling-hot to the straw-chaff, and the meal, and a little salt, were added. This, with a

little hay in the rack at night, constituted the food. I never knew steers and heifers feed faster than under that system. Steers, 2 years 8 months old, went out at £30 each, and one at 2 years 3 months old, at £28. I have for several years past given large quantities of straw-chaff and pulped roots to my store cattle, and the experiment of that winter proved to me that, much more meat can be made than is usually the case, by economising straw, and making it a vehicle of conveying the more nutritious, and fat-forming diet. We must look forward to covered homesteads, which will allow more straw to be employed as food."

Yet one more illustration ; that furnished by Mr. C. Randell, of Chadbury, Evesham, who won the Worcestershire Agricultural Society's first prize last year (1876), for having the best managed farm in that county, and whose advanced farming practices have, on several previous occasions, been dilated upon in the *Journal of the Royal Agricultural Society*,—who is an advocate for much more straw being utilised in feeding stock than what is commonly deemed necessary. The subjoined particulars of Mr. Randell's experience in the conversion of straw into beef, which he has been good enough to furnish me with (says Mr. Darby), will afford invaluable evidence in determining the value which should be placed on that article for feeding purposes on heavy-land farms ; while his method of winter-feeding sheep in yards, the sheds of which are supplied with burnt clay instead of litter, not only helps to elucidate the primary difficulty of keeping sheep in winter on clay farms, but admirably illustrates one of the main points in the present enquiry.

I have divided Mr. Randell's communication into two parts, so as to give that relating to sheep under the heading devoted to that special subject, in accordance with the arrangement, or plan, upon which the present work is written, the various topics necessarily running very much into each other when such a subject as general agricultural management is treated upon.

Mr. Randell says :—

"After having heard how readily and profitably straw, aided by roots, cake, and corn, is converted into beef in Norfolk, and other root-growing counties, and the manure, essential for the reproduction of the means of carrying on the process preserved, you may like to know how the occupier of a clay-land farm (where to attempt to grow turnips is, in the opinion of some good practical farmers in the neighbourhood, a sufficient qualification for a lunatic asylum), tries to convert his straw into manure which deserves the name without serious loss. I have—

15 two-year steers, feeding	}	These with their manure are entirely under cover.
25 milking and in-calf cows		
2 bulls		
6 two-year-old heifers	}	In small yards, shedding spouted.
15 yearlings		
63		

These 63 animals consume daily as follows :—

As much steamed chaff—one-fourth hay, three-fourths straw—as they will eat.			£	s.	d.
4 bushels Indian corn	costing	0	14	0	
1½ cwt. decorticated cotton-cake	"	0	12	6	
1 cwt. bran	"	0	5	6	
1 cwt. malt dust	"	0	5	6	
½ bushel Black Sea linseed (boiled)	"	0	4	6	
Per day			£2	2	0
			K		

for purchased food only. Now this cannot pay in the shape of a direct money return, and can only be excused by estimating highly the value of the manure; an estimate which will be fallacious, or otherwise, in proportion to the extent to which the manure is protected from rain. If it be made in large open yards, with the surrounding buildings unspouted, the loss is certain; in small yards, where the open space is not—and it never should be—more than as five to two of the spouted shedding, it is questionable; but in covered yards the cost of food may be recovered, while only one half the litter is necessary, thus economising straw and carting: for it is obvious that a much smaller quantity per acre of this concentrated and unwashed manure will be required for any crop. The cattle too, so protected, will give a greater increase for the food consumed."

The remainder of Mr. Randell's letter, which will be found most interesting as regards sheep, will be found under the heading of "Sheep."

CHAPTER VII.

OXEN (*continued*).

Feeding—Regularity in Feeding—Water—Experiment recorded by Sir John Sinclair—Varieties of Food—Cooked Food—Whole and Chaffed Straw—Oat and Wheat Straw—Salt—Winter Stall-feeding—Rotation of Roots—Storing Roots for Feeding—Frost-bitten Turnips—Bruised Corn—Weighing Machine—Selection of Cattle for Stall-feeding—"Points" of a Fat Ox—Summary of Winter Stall-feeding—Mr. Ogden's Plan—Summer Soiling—Cutting Grass—Feeding with Small Quantities—Substitutes for Hay.

Feeding.—In the last Chapter repeated reference has been made to the necessity of having spouted buildings to carry off the water, which otherwise soaks the litter in the yard, which, if not kept dry by this means, and also by drains, all the straw which may be given (and in some places immense quantities may be seen thrown down), will not cause the cattle to be comfortable.

Instead of having a dry bed to lie upon, and keep them warm during the inclement nights of winter, the damp arising from the wet litter chills their bellies, which, being the most tender part of the frames of oxen, not unfrequently occasions gripes, and gives them cold, sowing the seed of disease.

Not only at night, but in daytime, when cattle have to wade through the mire of a badly-managed yard,

their limbs become benumbed with the wet and damp, and they are more sensible to cold winds, than if they had been left out altogether in the unsheltered fields. Dryness and shelter, in fact, will be more conducive to health, than a great abundance of food, if given without proper attention to this necessary condition.

Careful experiments that have been made to prove the comparative degree of nourishment contained in the different species of food, have demonstrated that, the qualities of some will often vary in nutritive value from one to twenty per cent., and also that different breeds of cattle acquire various proportions of flesh from equal quantities of the same food consumed by them; for scarcely two individuals of the same breed can be found that will gain equal weights of flesh from equal quantities of the same kind of food. It will thus be seen that, no exact rule can be drawn for the quantity of food which a bullock may require daily, and observation, and care, necessarily have to be exercised in order to ensure the best results.

The quantity of roots differ very materially, not only according to the particular species, but as to cultivation, the season, and the soil. Thus, as is generally well known, Swedish turnips contain in the proportion about three to two more nutriment than the common white turnip, and a comparative difference exists in all other sorts, the common white turnip, which is the most extensively cultivated in England, and bringing the most abundant crop, affording less nourishment than any other. Swedes, however, cannot be exclusively preferred, as soil and season must be taken into consideration, the tankard, globe, and common white, being the earliest species; then the

red and green tops, succeeded by the yellow Aberdeen, and lastly the Swedish, which, retaining their sap the longest, are preferable for spring food. The animals enjoy the change also, by which they are benefited.

But upon whatever food the stock is fed, too much stress cannot be laid upon the necessity for furnishing them with adequate accommodation, which will ensure perfect shelter from the weather, with the proper degree of warmth. If kept in open hammels, the sheds should be sufficiently broad, the roof low, and the floor covered with an abundance of litter. By the box system of feeding there is generally warmth enough; and in close stalls a moderate degree of healthy ventilation is strictly necessary.

Regularity in Feeding.—Another point in profitable feeding, is strict regularity in the administration of food, both as to quantity, and the period of supplying it, which once appointed as to time, ought never afterwards to be altered. The ox is a quiet animal, which falls in easily, and naturally with habits of routine, and they soon get to know the precise hour at which their food is usually given, and if it is not forthcoming at the appointed time, or the customary quantity is not furnished—for a man, when attending to them, will sometimes find out he has barely enough for the last few animals he is feeding, and will divide what is left amongst them, with the intention of giving them more again—they become restless and fidget about, which is against their making satisfactory progress; but if served with precision, and regularity, they will remain perfectly tranquil, until the time for the next meal comes round.

Nothing is so favourable for the fattening process as perfect quietude, and if there is no disturbance, the beast will generally lie down to ruminate; and in order to favour this as much as possible, not only should the stalls be well bedded, but light should be very much excluded, the doors closed, and all harsh sounds and outward annoyances be prevented as far as possible, and everything done to promote contentment, ease, complete quiet, and rest.

Some feeders, anxious to do well by their stock, make a point of feeding five times a day. This is, however, thought too often by the most successful stock-keepers, who consider three times a day sufficient, the best times being as soon as possible after daylight, at noon, and at evening before sunset. This arrangement will enable the animals to fill their bellies and allow them sufficient time between the intervals for quiet digestion, which is apt to be interrupted by too frequent feeding. In apportioning the quantity of food, the beasts should not have so much given at one time as to clog them, but only as much as they can fairly eat with a relish. When they begin to toss the food about, it is a sufficient indication that the appetite is satisfied, and it should be instantly removed.

Water. — Water also should be given without limitation, more especially when a good deal of dry food is used. In many places cattle never get water oftener than twice a day, which is supposed to be sufficient for them, but it is not, as they are not able to drink enough for their necessities upon these two occasions.

Experiment recorded by Sir John Sinclair. — It is stated by Sir John Sinclair that an experiment was

once made to discover how often some cattle consuming straw and chaff on a farm, went to the watering-trough in a short winter's day, and an old man was appointed to watch them; and so that he might not be confused in the execution of his orders, one particular bullock was pointed out for his report; according to which he drank eight times in the course of the day, and the man was convinced that the rest of the cattle drank as often as the one particular bullock that had been fixed upon.

Thorough cleanliness is also a most important factor of success in the feeding of animals. The very first thing in the morning, the ox-house should be thoroughly well cleansed, both by pail and broom, from all dirt and impurity. The cribs and mangers should be carefully swept out, and even washed if necessary. If the hides of the beasts also are wisped, it will do them good; and it may be seen that the operation affords a pleasurable sensation. As they begin to fatten, the old coat falls off; and if this process is helped by the curry-comb, the improved appearance of the beasts will amply repay any man for the trouble, who takes a pride in his charges.

Varieties of Food.—Of late years oil-cake has been largely used in fattening cattle, and it is unquestionably a very useful agent; though, from the deep yellow colour of the fat of the meat when the animal has been largely fed upon it, the appearance is thought to be detracted from, and the flavour is pronounced not to be so good. Of all vegetable productions, nothing can be better than good sound hay, for improving the flesh of fattening cattle; but hay is very expensive by itself, and cheaper substi-

tutes have to be provided. As well as the artificial grasses, potatoes, mangold-wurtzel, cabbages, parsnips, and turnips, of various kinds, are all freely used, as well as distillers' and brewers' grains.

Treacle, poured over chaff and sliced roots, is also a useful agent in feeding; but for perfect quality, it has been considered, that no meat that can be produced by any other methods of feeding, will equal in succulence and flavour that furnished by an ox of mature age, that has been fed upon grass during the summer, and finished off in the winter upon fine meadow hay, with the addition of barley or bean-meal. Private gentlemen and others, who have plenty of pasture-land, and who make a great quantity of hay, can avail themselves of this method of feeding; but the plan cannot be followed by those whose pasture-land is but limited in extent, and the number of animals now fed in this—which may be termed the natural manner—is comparatively very few indeed.

In stall-feeding it is advisable, according to all admitted precedent and rule, to give a fair allowance of sound meadow hay—cut into moderate lengths, either with, or without some portion of straw—to correct the looseness occasioned by feeding on roots; and as has been shown, straw can be largely used as a cheap substitute when given with roots; and also the artificial grasses, which, at certain times, the animals are apt to partake too freely of if allowed, and so occasions looseness.

When roots are largely given, they should be used in succession; the most nutritive kinds being kept back to the last, for as they become fat, bullocks

grow dainty, and it then becomes a consideration to put the largest amount of nutriment into the smallest possible compass.

Various quantities of bran and pollard, pea and bean-meal, and bruised grain of all sorts, together with oil-cake and linseed-jelly, can all be profitably employed, and should be given in different quantities according to their price, the condition of the animals, and in accordance with the intention of their ultimate disposal; whether being hurried on to market or not. Bran and linseed-oil, in the proportion of two pecks of bran, divided into three feeds a day, with half a pint each of oil, has been found useful with some breeds of cattle in getting them forward.

In districts where the area of pasturage is large, and grass abounds, and hay is consequently much used in fattening, it has generally been found that a bullock of 50 stone weight, consuming 40 lbs. daily of sound hay, will put on flesh at the rate of 2 lbs.; and by this calculation, should, in twenty weeks, increase to 70 stone. Or, 16 lbs. of hay with a bushel of potatoes will have the same effect. Upon feeding with turnips, it has been shown by experiments, that oxen of 60 stone or upwards, besides an adequate quantity of dry food to correct the evil consequences of an unmixed supply of moist roots, will consume about 18 stone of common turnips daily.

Cooked Food.—It will be found highly advantageous to use as much as possible cooked, or steamed food. Experience conclusively shows that, almost all vegetable substances are capable of certain modes of preparation, which will develop their nutritive properties in an extra degree; and boiled, or steamed

roots afford more substance than when given raw, and many modern successful feeders made a mixture which, comparatively inexpensive, the animals eat with relish, and to the improvement of their condition.

It is, however, necessary for those in search of information upon these points, to possess an intelligent appreciation of the different results that are to be obtained from special modes of dealing with food. The chief value of boiling, or steaming the food of cattle, consists in rendering it more easy of digestion than when it is consumed in a crude form; and where vegetables have formed the chief article of food, they have been found to possess a more fattening quality, as the operation has the effect of depriving them of a part of their watery juices, leaving only the farinaceous, and other solid portions; during which, they will, of course, lose a certain amount of their weight.

Being softer than dry food, it is more readily consumed, and thus more time for lying down and taking rest is given, which is a matter of importance to a fattening animal; but in the case of young cattle, in the full enjoyment of their health and strength, the doubt may be admitted, whether the constant use of soft food may not weaken their powers of digestion, and relax the tone of their muscular fibre, it having been found from careful trials, that when only a small quantity of roots is given, the health and condition of the animals is improved, by giving them in a raw state, as in that form they have a kindly influence upon the bowels, and promote the digestion of grain and straw.

Where, however, a very large quantity of chaffed

straw is consumed, it may be advantageously used when steamed, in conjunction with some other kind of inexpensive food.

Whole and Chaffed Straw.—Where cattle are parsimoniously fed upon indifferent hay and straw, it is always necessary to cut it into chaff, for otherwise they will eat the good, and reject that which is bad ; but if mixed, they necessarily eat all up together. Mouldy hay when chaffed, that has been moistened with treacle and water, has been found to be eaten with avidity by cattle that would have rejected it in its former state.

Oxen can be well maintained during the winter months upon straw and turnips ; and if the straw is sweet and good, they will maintain their strength better upon a liberal allowance of straw, than upon a small quantity of hay in place of it. It should, however, be given fresh ; as if exposed to the air, it becomes deprived of some of the nutriment that is contained in it, and the cattle in consequence do not thrive upon it.

When straw is given whole quite fresh, the animals seem to prefer it in its natural state, and they will select enough of the best parts to satisfy their appetites, while the remainder can be used for litter, and thus the expense of cutting can be saved ; but this only answers when it is given quite fresh, there being no question that the air exercises an injurious effect upon fodder, and the more it is guarded from the atmosphere without suffering it to grow mouldy, the better it will be. When cattle are turned into a straw-yard, they are, of course, allowed to eat as much as they please, no saving being thought requisite, as the

largest portion is expected to be consumed in litter; but, as may readily be imagined, economy is desirable, even in this method of consuming straw; and by good management, a larger number of animals might be maintained, and consequently more profit obtained by the business in hand.

Oat and Wheat Straw.—Oat straw is generally preferred for cattle as being the more palatable of the two, yet wheat straw is considered by some to be the more nutritious, for although coarser, it appears to contain more saccharine matter than oat straw, and cattle are found to thrive upon it with a small addition of turnips. The dry fibre of hay or straw, if combined with turnips, assists materially in correcting the watery nature of the latter, and when sliced roots are given, chaffed straw can be used to great advantage.

Salt.—As pointed out before in another part of this work, it is highly necessary to provide the feeding animals with salt, and it will be found a good plan, in addition to giving them salt mixed up with their food, to have some lumps of rock-salt laid in convenient places where the cattle can lick it. In prepared food, salt should always form one of the ingredients, and the partiality evinced by the animals for it, will demonstrate the fact that, it increases their digestive powers, and consequently promotes their health and vigour.

Upon those farms where salt is neglected to be given to the animals, the fact is often made apparent, as the beasts may be observed to leave the best provender, and eat the litter from the stables of the horses—a sure indication that their stomachs require the assistance of the volatile alkali contained in the

urine of the horses absorbed by the straw, which their instinct teaches them to appropriate; and where straw is scattered in the yards in course of the day, both fresh and from the horses' litters, the oxen may often be seen to eat the litter in preference to sweet straw, and even toss it about with their horns in order to pick out those portions that have been wetted by urine. About two ounces of salt per beast per day would be about the proper quantity.

Winter Stall-feeding.—The preceding general remarks have been made chiefly in reference to winter stall-feeding, and it remains to be said that, when turnips are intended for stall-feeding, the whole of the green tops, or shaws, and top-roots, are cut off and given to the lean stock, and the roots should be laid up at one end of a barn with dry straw laid over them, which will effectually guard them against frost, from whence they can be taken to be cut up as wanted. The green tops being cut off when fresh, afford no inconsiderable quantity of food, which is immediately consumed at the time, by the young stock; and the turnips when housed are secured against frost, which often injures a great many in severe seasons. Swedes thus stored, though they will shrink in weight, will not only not lose any portion of their nutritive qualities, but be actually improved, as some of the watery particles will have evaporated.

For this purpose, mangold wurtzel is a most valuable root which comes in after the turnips are done, and mangold is much improved by keeping, the acrid juices to a great extent evaporating. On this account the Yellow Globe is more valuable than the Long

Red, by reason of its being a better keeper, though the latter is the heaviest cropper.

When thus fed with roots in order to have the best succession, it should be borne in mind what will be the most suitable crops to grow for the use of the animals where a large number is kept, for this consideration ought to influence the sowing of the seed of various crops with this end in view.

Rotation of Roots.—Thus, the white turnip will be the first to begin with, then the Aberdeen Yellow, afterwards swedes, next mangold wurtzel, finishing up with potatoes, carrots, and parsnips. The three latter will keep almost any length of time with proper care, till green crops come round again almost. Carrots and parsnips are very much neglected as crops for feeding cattle, but in the order I have named them, they exactly fit in with the office in hand, and carry out the principle recommended, of giving not only a change of food to whet the appetites of fattening beasts, but give that food in a more concentrated form in the advanced stage of fattening; it being commonly reckoned that, an acre of parsnips, carrots, or potatoes, exactly agree in nutritive value for the purpose of feeding cattle, with those of turnips; so that towards the last of fattening completion, it may be, with those animals that are about ready at that season of the year, in early spring one-third of the weight of these roots, in comparison with turnips, is sufficient.

Storing Roots for Feeding.—By having three weeks', or a month's supply of turnips ready drawn, the stock-feeder need never be prevented from using them by severe frost, which sometimes so completely locks

them in the ground that there is no getting them up. This, however, will chiefly apply to swedes, for however carefully common white turnips may be stored, they will generally betray symptoms of decay in about three weeks' time, according to the state of the weather, after which they become unpalatable, and the cattle do not like them.

Although in one case I have previously pointed out the convenience of having a root bin from whence the fattening animals may be easily, and quickly supplied, so as not to disturb them much in the operation of feeding, it will not answer to store too large a quantity under the same roof with cattle, as they soon become affected by the breath, and perspiration of the beasts, and tainted with the effluvia arising from their dung; so that they are no longer eaten with any degree of relish, and this is, of course, against the progress of the cattle.

Frost-bitten Turnips.—In cases of ordinary feeding with turnips which have been overtaken by frost, it has often been remarked that, when pressed by hunger to swallow them, in the event of no other food having been provided, the cattle will afterwards discover symptoms of great uneasiness, evinced by raising up their backs, and drawing in their feet, as if suffering from a sudden attack of cramp, which undoubtedly is the case. But this inconvenient result may be obviated, if the turnips whilst frozen, are placed under cold water, and allowed to remain there for three or four hours; after which, in taking them out, they will be found to be perfectly fresh and sound, and thus furnish another example of the usefulness of water when laid on to the feeding houses of animals.

Bruised Corn.—I ought not to omit stating here that, when animals are fed upon grain of any sort, that it is more nourishing when bruised, or pounded, than when given whole. In the form of meal, sprinkled over straw chaff, which has been previously wetted, so that the whole becomes thoroughly incorporated together, a valuable concentrated food may be given, which renders palatable the bulkier substances with which it is necessary to fill the bullock's stomach. It is also a good plan for each manger to be arranged upon the principle of having a separate division for dry food, as bran, chaff, or oil-cake; without being mixed with turnips or other roots for use upon those occasions, when it may be deemed desirable to feed them upon concentrated food alone. The cribs, where the accommodation can be provided, should be furnished with troughs communicating by pipes with a cistern for the convenience of watering cattle, without having the trouble of turning them out, or laboriously serving them in pails, the labour of doing which the men will sometimes shirk, unless they are looked after closely, and the animals suffer in consequence; and, as before suggested, it is the best plan to have a passage left at the head, sufficiently wide for the man who feeds the beasts to supply them with their food without going into the stall to disturb them.

Weighing Machine.—In order to discover accurately the *results* of feeding, and which method gives the greatest quantity of flesh upon the smallest quantity of food, every stock-keeper who is without one, will find it of the greatest advantage to be furnished with that necessary implement a weighing machine,

by which he may correctly ascertain the rate of improvement of his stock, as well as the expense he is incurring by balancing the weight and cost of food against the increase of the animal's weight.

Selection of Cattle for Stall-feeding.—In selecting cattle for stall-feeding a good deal will depend upon the knowledge and judgment used, for such cattle should be employed only for stall-feeding as are already in good condition, and by their appearance of breeding, and mellowness of touch, evince those qualities which proclaim an aptitude to fatten.

The question has often been debated, whether the large or the small sized oxen pay the feeder best for the food they consume, and the commonly received opinion is that the small ox, when kept fattening in the stall, will eat proportionately more without fattening quicker, than a larger sized animal.

The meat, however, of some of the smaller breeds, such as the Scotch cattle already described, is finer grained, which renders it more acceptable for family consumption, and being in favour in the market with butchers, commands higher prices, so that the size of the animal is perhaps not of such very great consequence to the farmer, or grazier; for if the flesh of the larger beast may be somewhat coarse-grained, yet, if well fed, it will make up to a considerable extent in rich juiciness, for what it lacks in delicacy of flavour, so that either kind will pay a fair profit, if properly managed.

It is a commonly expressed opinion, that a four, or five-year-old Scotch ox, carries more beef of a prime quality, which fetches a higher price in the market, than any young ox of another sort; but yet, as the

object of stock-keeping is profit, oxen of two, and two-and-a-half years old, are now continually brought to market, and the difference in the quality of meat is said not to be discernible. Although this assertion is somewhat improbable, as the flesh of a four-year-old ox will be more rich in its juices, and the flesh more handsomely "marbled" with fat and lean, which is so much admired by connoisseurs, yet the question of *profit* comes prominently forward, which will cause the young beasts to be most advantageously employed; but to carry this out successfully, those cattle should be selected which have the finest points in their favour, which will not only carry beef of the best quality, but consume the least proportionate amount in acquiring it, which is most likely to be found in those that attain early maturity, as in Shorthorns—a breed that would favourably contrast against my unlucky experiment of fattening an Alderney.

"Points" of a Fat Ox.—There is a wide difference between apparent, and real fatness in animals, for the flesh of an apparently fat beast may feel loose, and flabby, on being handled, while the ox that has been thoroughly well fatted feels *hard fat*, which butchers well understand; while those that handle loosely are not thought likely subjects to turn out well when killed.

The indications of first-rate condition are displayed when each bone of the beast is covered with flesh in such a manner as to constitute a perfect shape; when his hip-bones, or "huckle-bones" as they are technically called, are well rounded; his ribs smooth; his flank full; and his cod round; which are indications that he has been well fed. Upon feeling his lower-

most ribs, if the skin handles well, being soft, yet firm to the touch, it will prove that he is outwardly well fed, and his bones well clothed with flesh.

If the huckle-bones feel firm, round, and plump, a tolerably safe conclusion may be drawn that he is well fed, both internally, and externally, and will possess a good share of both flesh and tallow. If, also, on handling the beast at the setting-on of the tail, it appears full, thick, and soft to the touch, it is another indication that the animal is externally well fed, and, in this case, the "nach-bones," which lie on either side of the setting-on of his tail, will feel mellow.

If there are any doubts about the internal, and external condition of the beast, and further evidence or confirmation be sought, the cod is examined of an ox, and the navel of a cow, and if they feel respectively round, large, and plump, it is a pretty certain indication that the beast is well tallowed within, and a favourable judgment is formed.

Summary of Winter Stall-feeding.—The object in fattening, and rearing cattle is necessarily to do what is wanted to be done in as effectual a manner as possible, and at the expenditure of as little food as can be given consistently with the object in view.

The system used, at one time, to be commonly followed of giving the cattle as many sliced turnips as they could eat, and their racks supplied with fresh oat-straw daily. Good cattle have certainly been produced under this system, but excessive purging has frequently happened when they have been first put upon turnips in autumn, and this is to be remedied by causing them to eat more straw than they other-

wise would do if left to themselves. A medium-sized bullock will actually improve faster, when he has only 80 to 100 lbs. of turnips daily, with straw to fill up his capacious paunch, than when allowed to eat 2 cwt. of turnips, which he will do when he gets the chance.

The difficulty, under the old system, was to get the bullock to eat enough straw when it was given to them dry; but when chaffed, and mixed with small quantities of bruised linseed, bean or other meal, and salt, and then steamed in a close vessel, the flavour tempts the animal to eat a sufficient quantity, and one ton of roots can thus be made to equal two, without the aid of these contrivances; and many stock-keepers have thus successfully fattened cattle upon a daily allowance of 70 lbs. of turnips, with 6 lbs. of linseed, or other meal.

The experience of one large feeder is to the effect that, he finds his beasts thrive better on a small quantity of turnips than a large one; a bullock of 7 cwt. requiring from 60 to 70 lbs. of swedes cut up daily, and, together with this allowance, from 16 to 20 lbs. of cooked food, consisting of 1 lb. of linseed, and 2 lbs. of oil-cake meal, converted into mucilage by boiling, which is then poured over a mixture of 2 lbs. of bean-meal, 2 lbs. of bruised barley or oats, 10 to 12 lbs. of hay, a stone of chaff, and some salt, all well mixed up together and allowed to lie for 2 or 3 hours, so as to enable the dry chaff to absorb the mucilage.

In the border counties, where the best class of turnip soils are to be met with, cattle have been fattened by skilful management without any farinaceous food whatever, well-bred animals making rapid progress, their increase in value being entirely due to the

turnip-crop, so as to be brought to 70 stones imperial at two years old, but it is only upon really good soil, and with the most perfect management, that such results are to be obtained.

A Fifeshire farmer, in describing his management of cattle, stated that he found his beasts, when first put upon turnips in the autumn, would, if allowed to have as many as they could eat, consume daily 220 lbs. of cut swedes, with oat-straw in racks, and 5 lbs. of oil-cake besides, the animals weighing about 50 stones imperial.

He changed this course of procedure, and, instead, gave his beasts a feed at 6 o'clock A.M., consisting of 1 lb. of cake and 1 lb. of ground grain, well mixed with 5 lbs. of chaff, the latter having been well wetted with cold water before the cake and grain was thrown amongst it. At 8 o'clock the cattle have an allowance of 50 lbs. of cut turnips. At noon and towards evening the same kind of allowance is again given, the turnips and dry food as before at two separate times of feeding, so that by this method 4 or 5 lbs. of cake and grain, take the place of 100 lbs. of turnips.

Mr. Ogden's Plan.—This method of feeding, has long been practised in the north; many years ago a mode of feeding having been described by Mr. Ogden, in a report read to the East of Berwickshire Farmers' Club.

"My cattle," says Mr. Ogden, "are fed with turnips, bean-meal, oil-cake, and cut straw. The first thing in the morning they get the mixture afterwards described; then turnips, and at 1 o'clock the mixture again, afterwards turnips. On Sunday the mixture

is withheld. I find that a three-year-old steer will consume (if fed on them alone) from 16 to 18 stones of turnips daily. The mixture I am in the habit of giving cattle consists of 2 lbs. of oil-cake, 2 lbs. of bean-meal, 4 lbs. of cut straw, and $1\frac{1}{2}$ oz. of salt daily. This mixture can be purchased and prepared, at present prices, for 1*d.* per lb., or 2*s.* per head per week, six days in the week. I also find that cattle, when they have this mixture, consume at least 1 cwt. of turnips *less* per day than when fed upon turnips alone. The mixture is prepared in the forenoon by the byre-man, and keeps perfectly sweet for 36 hours. In preparing the mixture, to serve 24 cattle for 24 hours, 48 lbs. of oil-cake, 48 lbs. of bean-meal, 96 lbs. of cut straw, and 30 oz. of salt, are, in the first place, well mixed together in a trough; 36 gallons of boiling water are then added, after which the whole mass is well turned and incorporated together, and pressed down; and in an hour or two is quite ready for the cattle. The troughs in which the mixture is prepared are 6 feet long, 2 feet wide, and $2\frac{1}{2}$ feet deep. A trough of this size will contain mixture for 24 cattle, and the time occupied by the byre-man in preparing one troughful of the mixture, is not more than half-an-hour, the cut straw, meal, &c., being all ready."

Cattle may be fed to advantage with various kinds of foods of a widely different nature; and by cooking it, many things that would scarcely be looked at by them, are eaten with relish. Mr. Warnes, of Trimmingham, Norfolk, who is said to have introduced the box-feeding system, has published a description of certain compounds that he used with great advantage. Speaking of one process, he says:—"I com-

menced winter-feeding this year upon white turnips grown after flax, the tops of which being very luxuriant, are cut with pea-straw into chaff, compounded with linseed-meal, and given to my bullocks according to the following plan :—Upon every six pails of boiling water, one of finely-crushed linseed-meal is sprinkled by the hand of one person, while another rapidly stirs it round. In five minutes the mucilage being formed, a half-hogshead is placed close to the boiler, and a bushel of the cut turnip-tops, and straw put in. Two or three hand-cupfuls of the mucilage are then poured upon it, and stirred in with a common muck-fork. Another bushel of the turnip-tops, chaff, &c., is next added, and two or three cups of the jelly as before ; all of which is then expeditiously stirred and worked together with the fork and rammer. It is afterwards pressed down as firmly as the nature of the mixture will allow with the latter instrument, which completes the first layer. Another bushel of the pea-straw, chaff, etc., is thrown into the tub, the mucilage poured upon it as before, and so on till the boiler is emptied. The contents of the tub are lastly smoothed over with a trowel, covered down, and in two or three hours the straw, having absorbed the mucilage, will also, with the turnip-tops, have become partially cooked. The compound is then usually given to the cattle, but sometimes it is allowed to remain till cold."

Again, speaking of another period, he says, "I am now using a proportion of barley-straw with that of peas, according to the following plan :—'To nine or ten pails of water, a bushel of swede-turnips, sliced very small, is added ; after having boiled a few

minutes, about two pecks of linseed-meal are actively stirred in; the mucilage is formed in about five minutes. A hogshead is then placed by the boiler, and one or two skips of chaff thrown in. Three or four hand-cupfuls of jelly and turnips are next poured upon it, which, being mixed together with a thin-pronged fork, are firmly pressed down with a small rammer—three feet long, and five inches square at the bottom—with a cross handle at the top. The first layer completed, a small quantity of the chaff, &c., is put into the tub as before, till the boiler is emptied. The mass being covered down a short time, is ready for use.’”

Some persons object to the cooking process, which appears to them to involve so large an amount of extra labour. To these, a very simple method may be suggested upon the same principle, where the trouble will be avoided, that has been successfully followed with young stock from one to two years old. The mixture is composed of the following:—

50 lbs. of mangold-wurtzel sliced very small, 2 lbs. of oil-cake with 2 lbs. of bean-meal if necessary, and (in accordance with special views in feeding or not), 17 lbs. of cut straw. The mangold is best rasped or crushed, and then well mixed with the chopped straw. The cattle will eat it readily without any further preparation.

The examples I have furnished will show that, while the same principle pervades them all, various modifications can be made to suit the circumstances of each individual, and enable him to deal successfully with the crops he grows in feeding cattle, however diversified they may happen to be in their

nature ; and that by the purchase of small quantities of concentrated food, given with straw-chaff and other cheap substitutes, he may in effect double his amount of produce, when the food he raises is administered to cattle in the form recommended, and so be enabled to deal with twice the amount of stock he would otherwise have had the opportunity of doing. Nor must the extra fertility of his land be lost sight of by the farmer, who, by keeping a comparatively large number of animals, enormously increases his supplies of manure made at home, the quality of which is improved when the beasts are fed upon meal or cake, even in somewhat infinitesimal proportions, owing to the power of assimilation possessed by the stomach of the ox.

Summer Soiling.—The value of farm-yard dung, in sufficient quantity, cannot well be over-estimated, for although a variety of mineral manures may be profitably resorted to as auxiliaries, their effects tend rather to stimulate, and bring into action the powers of the soil rather than enrich it ; and many instances are known where, by their continued application, the land has been reduced to a state of great exhaustion, so that their operation has finally ceased, without the aid of putrescent manure. Although there are many instances where the soil is deficient in mineral properties, and the application of lime has been necessary, its injudicious use has been known so to impoverish large farms, that years have had to pass away before the land could be restored to the condition in which it was originally ; although it was for some time enabled to produce large crops of corn, it was finally worn out.

The case, however, might have been very different, in such instances as the above, had there been a full supply of roots, cabbages, &c., consumed by stock in the production of dung; for it is pretty well known throughout the various districts of the kingdom, that only a very small quantity of land has been found capable of carrying full crops, unless recruited by farm-yard manure at least once in four years; and this brings me to the question of summer soiling.

The objections urged against summer soiling are, that cattle when fed abroad are more healthy than when confined, and will find more enjoyment, and, consequently, more apparent vigour when in the field, than when in the yard. But, as in the case of my cows, where I have described that I set aside a small field for them to take daily exercise in, the same may be done with oxen, if thought necessary; and a few cabbages thrown down for them to eat (I am now speaking, of course, of store stock) in the cool of the evening, or early morning; and by keeping them in yards, all the annoyance of flies during the summer will be avoided, and the great advantage of quietude is, that they are enabled to fill their bellies and lie down to sleep and ruminate, which is favourable to their progressive improvement; and the same yards with dry sheds which are warm in winter, are also cool in summer.

Cutting Grass.—Cutting grass in a green state to be used at home is very rarely done in England, though the Flemish plan of repeatedly mowing the meadow-grass while young, is constantly, and successfully practised. The common idea in this country is, that the constant mowing, instead of depasturing the

cattle, has the effect of impoverishing the meadows. But this is a mistake, because the soil is not exhausted if the grass is cut before it comes into seed, nor even if after the seed has been formed, provided that an equivalent is returned to it in the shape of a proportionate amount of manure, which the cattle are making all the while, ready at hand, to be placed exactly where it is most wanted.

Winter soiling is admitted to be an excellent plan by all agriculturists, and there is no doubt that, were summer soiling carried on with the same spirit, and attention to details with the natural, and artificial grasses, that the like advantageous results would be obtained.

Besides the vast amount of saving to the crops from the destruction caused by cattle when on pasture by staling, dunging, treading, and lying down upon them, which must inevitably cause a waste, many of the finest grasses, which, when young, are highly relished by the cattle, when they become stalky, and reach the seeding-stage, are refused by them, and so much produce is lost; whereas, if cut down in proper time, not a plant will be lost.

When fed in the yard, too, they will eat with the rest many coarse grasses and weeds, which they will refrain from touching when growing in the field.

Nor must the increased value of the power of application of the manure be overlooked, that may be obtained by this system. Although it is true, the same amount of manure is made in the field as in the yard, yet, in the former instance, a great deal of it is lost by being dried up by the air and sun, besides being deposited in out-of-the-way places—under trees, by

the sides of hedges, and ditches, and by the gates used for egress, and ingress from, and to the field—so that it can never be equally spread over the land. In the yards, on the contrary, it is conveniently under control, and can be immediately collected before any great evaporation takes place, and can be dealt with in an effectual manner, as recommended in another place under the section of “Manures,” while the urine can be collected in tanks, and the whole business effectually managed in the most complete, and perfect manner to ensure the end in view.

The dung of a beast fed in a stall upon green food, would amount to about a ton in a month; this, when in a humid state, if added to road-scrappings, the scouring of ditches, or sand, would make a valuable mixen ready to be applied to any part of the farm, where such an application is much wanted, perhaps, that without this means, there would be no other opportunity of supplying.

Feeding with small quantities.—When summer soiling is practised, it is desirable to give the food often, and in small quantities, so that the cattle may not otherwise blow upon it, and reject it, as well as not to supply it in such abundance as to clog them, when it will not be relished, and the beasts consequently suffer in condition. The remains of food should therefore be immediately removed, or indeed before they are quite satiated. The grass that has been blown upon by other animals is not, however, objectionable to those of another species, the sweepings of horse-stalls being relished by oxen, and if by any mischance there should be any left, the pigs will eat clean up the refuse of any other stock.

Especially should green-food be given sparingly at first, as the cattle eat it very greedily when put upon it after dry food, and the accident of "hoving" occurs. Straw should also be given to correct any looseness of bowels that may be occasioned by the use of green food. In the early part of the season, when feeding upon artificial grasses, and tares and clover are inadequate for the support of the stock, or it becomes expedient to change them gradually from dry, to green food, hay or straw-chaff should be mixed with the grasses upon which they are fed, for tares, lucerne, sainfoin, and clover, though all favourable to health, may prove injurious if given in too great quantities.

The grass, either natural or artificial, should be cut twice a day, early in the morning and late at night, so as to avoid the withering heat of the noonday, for, if not more nutritious, it is more palatable in a fresh state than when stale, and the animals eat it with greater relish, while the danger of "hoving" can be guarded against by the use of adequate circum-spection.

When these grasses are mixed with hay or straw, if the mixture is made up overnight, they will communicate a sweet, vegetable taste to the dry provender, which will cause it to be readily eaten; but it is an error to suppose that straw given before grass can be used in that manner, for the cattle in a short time will refuse to eat it.

Substitutes for Hay.—Green crops may thus be regularly cultivated, and profitably consumed throughout the year. Rye-grass, lucerne, winter-tares, in the early part of spring; clover, spring-tares, sainfoin, and

the repeat cuts of lucerne, during summer ; the aftermath of the meadows, and clover for autumn ; together with the crops of turnips, mangold-wurtzel, potatoes, carrots, and parsnips for the winter months, may all successively be used, without hay even being used at all, upon those farms where there is little or no pasture-land. Even on heavy clay-lands, where no turnips can be grown, cattle may be profitably and successfully reared through means of the feeding expedients to which I have made allusion, though such an attempt might be laughed to scorn by those worthy sort of men alluded to by Arthur Young, who only swear by the ancient practice of the old women their grandmothers. These expedients are, indeed, well worthy of the most serious consideration on the part of arable-land farmers, who find they cannot grow corn profitably, so as to compete with the produce of America and the North of Europe, and are at their wits' end how to make both ends meet ; while dairy-farming eminently so, and stock-feeding in a less degree, can be made amply profitable.

CHAPTER VIII.

THE DISEASES OF OXEN.

Hæmaturia—Inflammation of the Kidneys—Diseases of the Organs of Respiration—Catarrh—Hoarse—Pneumonia—Inflammation of the Brain—Apoplexy—Method of estimating Weight—Table of Measurement to determine the Weight of Oxen.

The Diseases of Oxen.—Under the heading of “Dairy Farming” I have already devoted a chapter to the diseases of oxen, such as are common alike to both the ox and the cow; but there are some ailments which are more frequent with oxen than cows, which cause the subject to demand a little more notice.

Hæmaturia.—This is a complaint to which oxen are more liable than cows, and is the term applied to the discharge of urine with blood in a state of coagulation. It is caused by the rupture of small blood-vessels in the urinary passages, and is brought on by strains, or produced by the cattle riding one another.

Bleeding and purgatives are generally resorted to, and in some cases a stimulating medicine is administered with good effect, consisting of—

Oil of turpentine	.	.	.	.	.	1 oz.
Tincture of opium	.	.	.	.	.	1 „
Oil of juniper	.	.	.	.	.	2 drachms.

which is best given in linseed gruel.

Inflammation of the Kidneys, or Nephritis.—This may be produced by blows or strains of the loins, as well as by exposure to cold or wet. It is usually

manifested by an appearance of great pain and weakness in the loins, accompanied by the discharge of very dark-coloured urine, with symptoms of fever.

Bleeding is generally resorted to in the first instance, and a purgative administered, while the loins should be well stimulated with a mustard poultice, and linseed gruel given.

Diseases of the Organs of Respiration: Catarrh.—Horses are more liable to diseases of the organs of respiration than cattle, which are hardier, as a general rule, on account of their being more exposed to the vicissitudes of the weather, and are, therefore, less liable to diseases arising from this cause than horses, which often come out of a hot stable into a colder atmosphere. Cattle are most liable to become affected when the wind is easterly in the spring of the year, particularly if the weather happen to be wet and cold. Young animals are more disposed to be affected than the elder ones; and if they are well housed, and have dry beds, and a few bran mashes given to them, in which there is a little nitre, they will soon get well in ordinary cases.

If, however, the attack is severe, and there should be symptoms of inflammation, a dose of Epsom salts should be administered, and it may even be desirable to bleed moderately. When an outward application may be deemed necessary in the shape of an external stimulant, the following recipe for the purpose will be found an effective one—

Powdered cantharides	.	.	.	.	.	1 oz.
Olive oil	.	.	.	.	.	6 "
Oil of turpentine	.	.	.	.	.	2 "

well mixed together.

When catarrh is neglected, bronchitis often follows, and consists of an extension of inflammation over the same membrane, but having a more dangerous, and extensive part; that is to say, the internal surface of the lung. Bleeding is the remedy in the early stages of the disease, and a seton should be inserted in the brisket, and mild, aperient, and febrifuge medicine administered.

Hoose.—Hoose is a disease of the wind-pipe, to which young cattle are the most subject, and particularly young calves. The animals affected have a dry, husky cough, with quickened respiration, and they exhibit signs of great weakness, and show an indisposition to move about. This is due to the presence of small white worms in the wind-pipe, and bronchial tubes, which occasions constant irritation. Half-a-pint of lime-water given every morning to each calf, and a table-spoonful of salt each evening, should be given for four or five days consecutively. Or, an ounce of turpentine in four ounces of linseed-oil once a week several times, will effect a cure. The disorder has been noticed as most frequently occurring in those cases where calves, and young stock, have been kept in bare pastures during the summer months, and the worms are supposed to be produced by eggs taken up with the water at that season of the year.

Pneumonia.—Young cattle, particularly calves, are much more subject to this disease than older ones, the disease consisting of inflammation of the substance of the lungs. It is generally produced by a sudden change from a dry locality to a damp one, though sometimes over-exertion will produce it, especially when an animal has been over-fed. Young stock that

have been turned upon damp land are the most likely to become affected by it.

The breathing is quick and laborious, and the pulse, though not usually much quicker, is sometimes full and strong, but more commonly weak. The cattle affected are generally found lying down, the calves invariably so, which is due both to loss of strength, and that they can breathe much more freely in a recumbent position. Rumination, however, ceases, the membrane of the nostrils appears red, and the mouth feels hot.

Abundant bleeding is generally prescribed, aperient medicine given, accompanied with febrifuges and counter-irritation; the bleeding being continued till the pulse falters; four to six quarts of blood, or even more, being taken away, and repeated in six hours if the symptoms are not relieved, and the pulse does not betray signs of being too weak.

Inflammation of the Brain, or Phrenitis.—Though a somewhat rare disease with oxen, it is sometimes occasioned by over-driving, and great excitement, and extreme violence is exhibited. Treatment is not often very effectual, but where it can be resorted to, it consists of copious bleeding and physic. It is difficult to perform the operation of bleeding when the animal is violent, but advantage may be taken of the thirst to give Epsom salts in large quantities in the water consumed. If at all in fit condition for the butcher, it will be the better course to slaughter the animal at once; but if the disease has reached an advanced stage, the flesh will be unfit for human consumption.

Apoplexy.—Cattle are more subject to apoplexy

than inflammation of the brain, and consists of a determination of blood to the head. As the premonitory symptoms are seldom observed in time to allow of any effective treatment to be resorted to, it is often very rapidly fatal. The disease, which may be attributed to redundancy of flesh and fat, can only be met by copious bleeding and active purgative medicines.

For palsy, meteorization—commonly termed hoove, hoven, or blasting—distension of the rumen, choking, loss of cud, diarrhœa, redwater, retention of urine, rheumatism, pleuro-pneumonia, as well as diseases to which cows are subject, such as the drop after calving, abortion, slinking, slipping calf, or warping, inversion of the uterus, as well as diseases of the skin, I must refer the reader to the section of this work which treats upon “Dairy Farming,” where a notice of each, and some other diseases will be found.

Most of the diseases to which cattle are subject are preventible by good housing, and careful feeding, and where the stock-keeper breeds his own animals, there is very little risk of contagion; so that he is in a condition to supply good, sound, reliable beasts to the butcher, or dealer, to whom he sells them; and this observation reminds me that it is necessary to refer to a very essential consideration betwixt buyer and seller, and that is a correct estimation of the weight of the animals.

Method of estimating Weight.—The weight of an animal may always be correctly ascertained by means of the steel-yard, which no grazier who conducts his business upon anything like an important scale should ever be without; for it will be of the greatest assist-

ance to him while his beasts are fattening, and he can at all times ascertain correctly their progressive rate of improvement, by which, as well, he may estimate their progress against the cost of the food with which he is supplying them ; but the steel-yard cannot be used with accuracy unless the animal has fasted for at least twelve hours.

The chief difficulty to an inexperienced person is to estimate the difference between the live, and dead weights of an animal, which are usually calculated at per stone of 14 lbs. for the live, and the stone of 8 lbs. for the dead weight ; and this has led to the system of *measurement* of live stock, by which the animal's weight can be ascertained with tolerable accuracy, according to certain tables which have been drawn up by experienced men.

The measurement is taken by passing a cord just behind the shoulder-blade and under the fore-legs, which gives the girth or circumference, and the length is taken along the back from the foremost corner of the blade-bone of the shoulder, in a straight line to the hindmost point of the rump, or to that bone of the tail which plumbs the line with the hinder part of the buttock. The girth and length are then measured by the foot-rule, this being the approved method which is found to be applicable to every kind of animal ; the length within certain bounds being always found, up to a certain point, or commensurate scale, which has been fixed upon, to agree with a definite weight, the tables being calculated upon the stone of 14 lbs. avoirdupois by multiplying the square of the girth by the length, and this product by a decimal which may be assumed as nearly $\cdot 238$ for

the live weight. The dead weight is ascertained by multiplying the live weight by the decimal 605—thus, $\frac{605}{1000}$ —which will give the product of the four quarters.

Cary's Gauge—which is a handy instrument for the purpose, and there are probably more modern ones—is made upon the principle of a slider rule, which gives the weights marked in stones of 8 lbs. and 14 lbs. The following tables, which are closely in accordance with each other, have been compared with the results derived from animals that have been measured when alive, and afterwards killed and weighed, and they have been found to approximate so nearly to the exact result, as to be depended upon as affording a tolerably accurate rule to apply to ordinary animals.

TABLE
OF MEASUREMENT TO DETERMINE THE WEIGHT OF OXEN.

Girth.	Length.	Renton's Table.	McDermot's Table.	Cary's Gauge.
ft. in.	ft. in.	st. lbs.	st. lbs.	st.
5 0	3 6	21 0	20 11	21
	4 0	24 0	23 11	24
5 6	3 9	27 1	27 0	27
	4 9	34 4	34 2	34½
6 0	4 6	38 8	38 8	38½
	5 0	41 3	42 12	43
6 6	4 6	45 9	45 3	45½
	4 9	48 0	47 10	48
7 0	5 6	64 6	64 2	64½
	6 0	70 5	69 13	70½
8 0	6 6	99 8	99 0	99½
	7 0	107 5	106 9	107½

CHAPTER IX.

SHEEP.

Sheep-farming—Varieties—Leicester Sheep—Southdown Sheep—Black-faced Sheep—The Cheviot—Romney Marsh Sheep—The Cotswold—Lincolnshire Sheep—The Teeswater—Selection of Breed—Age and Names of Sheep—Breeding—Number of Ewes to a Ram—Smearing the Breast of the Ram—Yeaning—The Lambs—Weaning—Feeding—Mr. Randell's Management of Sheep—Diseases of Sheep—Diarrhoea in Lambs and Sheep—Dysentery, or Braxy—Catarrh—Concretions of the Stomach.

Sheep-Farming.—Sheep-farming can be made extremely profitable under thoroughly good management, upon land suitable for their maintenance, and where there is "ample verge" and room enough for the business to be carried out in an effectual, and systematic manner.

I must, however, preface the remarks I am about to make by saying that I have never kept any great number myself, a dozen or so being the most I ever have on hand—not because I do not highly appreciate them as stock, but because I aim at dairy produce, and lay out my forty acres of grass as much as possible for the maintenance of cows; and these, with a number of pigs which can be profitably kept where dairy-farming is followed, and a good many roots grown, together with the various odds and ends

I am able to scrape together, such as acorns, &c., by which I am enabled to keep them very cheaply, I find my hands quite full enough without going into sheep-farming. The small number I have kept, however, have been quite sufficient to prove to me by their rate of increase that sheep as stock can be most successfully dealt with; and I have made it my business to acquaint myself with the best methods of management to be followed, the salient points of which I herewith give my readers. I have now and then lost a sheep by its falling on its back in a rut, and breeding the few I keep, myself, I have had a little trouble now and then with diarrhœa in lambs, and occasionally with maggots in the older animals, which are produced from flesh-flies, which lay their eggs upon the skin, where they hatch; which, if not speedily attended to in spring, and summer are often fatal to sheep.

The fattest animals are the most likely to be selected by the flies; and it is the business of a shepherd to keep a sharp eye upon his charges, and by constant attention, clipping, and cleaning the parts affected, serious mischief may always be prevented in time; but, of course, as my small number have not the advantage of a regular shepherd, they are not quite so sharply looked after, perhaps, as they ought to be, and I have thus had, perforce, to make myself acquainted with their various requirements, and, so to speak, their natural history, which has given me a great deal more trouble at times, very likely, than if I kept a greater number which were efficiently looked after by qualified men engaged for the purpose.

Varieties.—The chief broad distinction which lies between the various varieties of sheep consists of their being "long-woolled" and "short-woolled." The latter are small in carcase, and are covered with a fine, but short coat of wool, their natural *habitat* being upon the thin-soiled uplands of the downs and mountainous heathy pastures, while the former are those fed in the lowlands upon rich pastures, or marshes, which have both longer and coarser wool. These again are divided into horned, and polled. But the practice of crossing short-woolled, or mountain ewes, with long-woolled rams has long been followed with very advantageous results; the blending of breeds, when judiciously managed, having proved remarkably profitable to both breeders and graziers, the occupations being often distinct ones.

The advantages to be derived from this course of procedure consists in the fact that, ewes of the mountain, and South Down breeds, are more hardy and prolific than the larger, long-woolled low-country races; while the progeny resulting from these crosses, when well fed, attain to very nearly the same size and weight as the larger varieties—the Leicester breed of rams being largely used for this purpose, the result being that, the sheep produced in this way inherit the fatness of one parent, with the superior flavour, juiciness, and large proportion of lean flesh that distinguishes the other; the consequence being that while, on the one hand, the meat of the larger varieties is too fat, and lacking in flavour to please the palates of consumers, and that of the short-woolled is too small to be profitably made use of in family consumption, a kind is produced which sells at the best price of

the day; the cross generally preferred in England being that between a South Down ewe, and some good long-woolled variety, according to the fancy of the breeder, and in Scotland that betwixt a Cheviot, or black-faced ewe, and a Leicester ram. The black-faced sheep of the north of England and the Highlands of Scotland are generally termed "Black-faced Heath" breed, to distinguish them from some of the dark-faced forest breeds of England.

As well, also, the wool, which is a very important consideration in sheep-breeding—the wool-stapler in his way being as important as the butcher—being long, close-set, and fine in the staple; both weigh well, and command a full price per pound.

The long-woolled breeds comprise the Leicester and Lincoln, the weight of whose fleece in the yolk and unsmeared, will weigh 8 lbs. to 10 lbs., and 24 to 36 lbs. dead weight of the flesh per quarter; the Teeswater fleeces 7 lbs. to 8 lbs., and the quarter 26 lbs. to 36 lbs.; and the remainder, with respective weights of wool and fleece coming a little below these figures, comprises Cotswold (polled), Bampton Nolls (polled), South Ham ditto (polled), Romney Marsh, Dishley and Irish, all polled.

The short-woolled varieties embrace a much longer list, the weights of whose wool and quarters range between the Portland breed, with fleece weighing only $1\frac{1}{2}$ lb. to 2 lbs. (horned); the Shropshire Morf about the same—the dead weight of the flesh of the quarter being 8 lbs. to 10 lbs. in the case of the former, and 9 lbs. to 13 lbs. in that of the latter; and pure Mervin (horned and polled), whose fleece weighs 4 lbs. to 5 lbs., and quarter, 15 lbs. to 18 lbs. The Exmoor and Dart-

moor give proportionately more wool for their size than many others, which reaches from 3 lbs. to 4 lbs., the quarter averaging from 10 lbs. to 12 lbs. South Down (polled), which is a favourite breed, yields $2\frac{1}{2}$ lbs. to 3 lbs. of wool, and 18 lbs. to 20 lbs. per quarter; Cheviot (polled), $2\frac{1}{2}$ lbs. to $3\frac{1}{2}$ lbs. of wool, to 12 lbs. to 18 lbs. per quarter; and the remainder which follow more or less varying, as Wilts and Chiltern (horned); Dorset, do.; Cornish, do.; Dean Forest and Mendip, do.; Delamere Forest, do.; Scotch Heath, Irish (there being short-woolled as well as long-woolled Irish), Norfolk, Shetland (horned and polled), Cannock Heath (polled), Herdwick, do.; Welsh Mountain (horned and polled).

The varieties I have enumerated will give an idea of the original breeds of sheep; but so many half-breeds are now to be found, partaking of the various qualities of each kind, that new breeds may be said to have been created by the improvement of material points, while some of the old breeds have become nearly extinct. In some parts of Sutherlandshire, by persevering attention to the choice of rams, change of feed, and by placing the sheep of different ages upon the most appropriate pasture for them, together with supplying them with artificial food during the inclement season of winter, the weight of wool has been considerably increased, as well as the amount of flesh per quarter.

Leicester Sheep.—One of the most important breeds of English sheep is the Leicester. Originally a large, ungainly, coarse-boned animal, it has become vastly improved, owing to the exertions of Robert Bakewell, of Dishley, near Loughborough, who has made him-

self famous through all succeeding generations of sheep-breeders since the year 1755, when he first began to turn his attention to the common breed of the district—the old Leicester—the result being the world-renowned “New Leicesters.”

The New Leicesters were deficient in weight of fleece, and there have been several departures from the distinctive features of Bakewell's sheep, that are improvements upon the stock, their amount of wool being greatly increased; and, although these various crosses have at length settled down into the form of the animals that are now recognised as the modern Leicesters, and many complacent owners of fine specimens boast of them as being “pure Leicesters,” there never has been a breed, perhaps, that has been crossed so often, and whose blood has been so frequently mixed; happily with the most fortunate results.

The meat of the New Leicesters, when not over-fed, is of excellent quality; the bone being small, with a considerable amount of fat, which causes it to be of a saleable description in most of the business, and manufacturing centres of the kingdom, where profitable joints are required for family use.

To fastidious palates, the mutton of the Leicester sheep is not so acceptable as many others, the cross between a Cheviot ewe and a Leicester ram producing finer meat in point of quality. Leicesters that have been over-fed produce meat of an oily lusciousness, that has done a good deal to set young persons, and especially children, against mutton, whose stomachs are more easily cloyed with fat meat than those of their elders.

The average weight of a twenty-two months old Leicester wedder, would be from 90 lbs. to 100 lbs.; though specimens of older animals at cattle-shows are sometimes exhibited, weighing 300 lbs.; and taking them all together as they now stand, they are generally looked upon as occupying the first rank amongst long-woolled sheep.

According to Youatt, Bakewell appears to have first introduced the practice of letting rams in 1760, though he met with so little encouragement at the beginning, that he let his first ram for 17*s.* 6*d.*, and that for several seasons he could not realize more than two or three guineas for his best sheep. When the public, however, became in time enlightened as to their value, the price of his rams gradually rose, until, in 1784-85, he received as much as 100 guineas for a ram. The fame of his breed continued to increase: till, at last, in 1789, he made 1,200 guineas by three rams, and 2,000 guineas for seven others. He likewise received 3,000 guineas from the Dishley Society for the use of the rest of his flock. The most extraordinary letting which occurred, was that of a ram called "Two Pounder," for the use of which, during one season, he obtained 400 guineas each from two breeders, still reserving one-third of the usual number of ewes for himself—the value of the ram for that season being thus rated at 1,200 guineas!

The great value of the Leicester breed consists in its disposition to fatten, arriving at a certain maturity at an early age—with the exception of rams and ewes none being kept longer than two years; while many breeders have them ready for the butcher at fifteen, or sixteen months old, or immediately after they are

shorn. To attain this result, it is needless to say they must be well looked after and cared for; and well fed from the day they are first dropped, to the one on which they are disposed of to the butcher.

Mutton is not in its prime till four or five years old, though a very common mistake prevails on this head, the remark being often heard that a joint is remarkably good, "almost like lamb;" the object, of course, being profit to the breeder, who best attains this by pushing his flock on, so as to be ready for the butcher in the shortest possible space of time.

Although the mutton of Leicester sheep may not be so well liked as that of many others, for crossing the Leicester ram stands unrivalled; and he is thoroughly well appreciated for breeding purposes from one end of the kingdom to the other.

South Down Sheep.—The South Downs, which confer their name upon this well-known breed of sheep, commencing at the east end of the county of Sussex, continue westwards through Lewes, Shoreham, and Arundel, by a continuous chain of hills, into Hampshire, whose length is upwards of sixty miles; the average breadth being about five miles. The herbage of this district, upon which sheep have been fed from time immemorial, is very sweet, but short and fine; the dryness of the air, and the moderate elevation of the district, being very favourable to the race of animals which may be said to be indigenous to it.

Like other varieties, they have altered in shape and character very much from what they were originally, through successive improvements in breeding;

being now smaller in the bone, with a greater aptitude to fatten, and a heavier carcase when fat (though equally hardy) than they formerly were.

From 12 lbs. to 14 lbs. per quarter used to be considered a fair weight for a South Down wether, two years old; though they were not usually fattened till they reached four or five; at which age they would average about 18 lbs. per quarter. They would then be in their prime, and justify the partiality which both history and tradition inform us (according to Mr. Laurence), was shown towards their mutton by Charles II., of mutton-eating memory, whose travelled and discriminating palate could appreciate its excellence, and thus—

“——had heard Sir Robert Sutton
Say how the king loved Banstead mutton.”

They are now usually fit for the butcher at from fifteen months to two years old; the dead weight of wethers varying from 16 lbs. to 22 lbs. per quarter, though as great a weight as 40 lbs. to 50 lbs. per quarter are sometimes attained by prize beasts; and the breed is well suited to almost all the midland counties of England, as well as the southern districts of the kingdom, where they have long been highly popular.

Black-faced, or Heath Sheep.—This breed is supposed to have originated in the mountainous districts of Lancashire, Westmoreland, and Cumberland, and to have been introduced into Scotland at a very early era, where it has gradually extended itself, until it has finally become the prevailing breed in those situations where the herbage is of the coarsest, and most inferior description. The wool of the Heath-sheep does not

resemble that of most other mountainous breeds in being fine, short in the staple, and thick; but is thin and coarse, of a hairy nature, being quite the reverse of other breeds inhabiting similar districts but where the climate is not so cold and humid—to which difference is doubtless to be attributed this peculiar quality, a humid atmosphere having the effect of lengthening the wool of sheep.

When of a fine breed, the face and legs of the ram are either black or mottled, and between the horns there is a round tuft of soft wool of a lighter shade, the lips and muzzle being of the same hue—the latter being long and clean, and the jaw perfectly free from wool. The tail, being naturally short, never requires cutting. The horns spring easily from the head, and incline both outwards and downwards, with two or more spiral twists. The eye is full of fire, and the bearing free and independent. The general appearance of the ewe is similar to that of the ram, but the horns are not spirally twisted, and are much smaller in size; they drop their lambs two or three days sooner than other breeds, and, when born, have horns from one to two inches long.

The Heath-sheep are not so restless under confinement as the Welsh, and some other mountain breeds; and, if properly attended to, will not give much trouble. They feed readily, and weigh, when fat, about 16 lbs. per quarter; though considerably greater weights are reached by prize animals, which, when very fat, have a large quantity of loose tallow in them, in proportion to the weight of the carcase. The best crosses that have been obtained with them are those from Leicester, or South Down rams; it being a

necessary point, when using Leicester rams, that they should be good sized, kindly feeders, with fine and moderately open fleeces, and be active, and sprightly specimens of their kind, so as to follow the ewes up steep hills, for which the Heath breed are peculiarly appropriate.

The wool of these sheep is of an inferior description, fitted for the manufacture of the coarsest fabrics only, and consequently fetches but a low price in the market; for though the bright-haired wools of some species, as the alpaca, which was utilized to a great extent at Bradford in Yorkshire, by the late Sir Titus Salt, realises a good sum, that is altogether of a different character, and is appropriate for the manufacture of superior textile fabrics.

On stony, and barren grazings, there will be found no better breed than the black-faced Heath-sheep; and many flock-masters in the Highlands—who have been under the false impression, that a larger profit was to be got from Cheviots, from the results that have been obtained from them on those farms naturally adapted to their maintenance, and have made an unwise change—have had occasion to regret it; for they have established a small, unthrifty Cheviot, instead of a good Heath-sheep, which had become thoroughly adapted in size and constitution to the peculiarities of the locality.

The Cheviot.—The chain of hills which bound Northumberland upon the north, and pass into the adjoining districts of Scotland, are separated from each other by narrow valleys of deep alluvial soil; through which brawling streams often flow, the ground rising abruptly on either side, which, though

steep, generally presents a smooth and dry surface, naturally well drained by rivulets which pass through them, and are clothed with valuable grasses fit for the support of sheep. These hills, from time immemorial, have produced a valuable breed of sheep, comparatively large in carcase, and with a good supply of fleece, capable of enduring privation, which they sometimes have to undergo in snowy, and stormy weather; in this respect, second only to the black-faced Heath breed, to which they are far superior in their production of wool—a point of great consideration.

On extensive grazings the sheep are divided into flocks of 400 or 500, each being under the charge of a shepherd, to whom a certain defined district is allotted for the "run" of his flock; a salient feature in which system renders it necessary that they should have access to both sides of a hill or ravine, to either of which they may betake themselves, according to the direction of the wind, for shelter during storms.

In by-gone years, the Cheviot was chiefly esteemed for his fleece, but since the importation of such large quantities of wool from Australia, which now find their way to the various series of colonial wool sales held in London, a great change has taken place in the character of both the fleece, and the carcase; and the close, short staple of former times has been exchanged for one considerably heavier, but longer, more open, and somewhat coarser,—while the carcase has been made to exhibit those features which ensure early maturity, and a ready disposition to fatten: which has been done by judicious breeding, this having been chiefly effected by repeated crossings with Leicester

rams, and by an intelligent application of the true principles of breeding.

Cheviot sheep might be advantageously substituted for the same unprofitable varieties that are now found in the mountainous districts of Wales, and Ireland; which, however well adapted by Nature for the situations they occupy in point of hardiness and general constitution, are yet too small in size to make a good return for their grazing and feeding.

Romney Marsh Sheep.—A valuable breed of sheep is fed in Romney Marsh and its neighbouring lowlands, on the shores of Kent and Sussex, which I have before mentioned as being classed amongst the long-woolled varieties, which are especially adapted to the rich marsh pastures of these districts. They have been established in them from time immemorial, and are almost the only breed of sheep capable of bearing the amount of exposure to which they are subjected, and the fierce gales which blow over them from the Channel. Great produce of wool, and thickness in stocking, are the principal points of this breed; their symmetry and feeding properties having of late years been much improved by crossing with the New Leicesters.

The Cotswold.—The Cotswold are a heavier breed than the Leicester, and more active in habit, and are both contented with less food and are more patient of cold. They are chiefly to be met with in the counties of Gloucester, Oxford, Hereford, and Worcester, and are considered well adapted for the general range of pastures in these districts.

Lincolnshire Sheep.—The Lincolnshire was formerly a distinctively marked breed, being ungainly animals,

with long thin carcasses, thick rough legs, and large boned; and although they attained to a great weight, were very slow feeders. Their chief value laid in their wool, which was from ten, to eighteen inches long; their fleeces weighing from 10 to 16 lbs. apiece.

Pure old-fashioned Lincolns are now rarely to be met with; for, upon the improvement of the Leicester breed by Bakewell, the new, or Dishley breed was engrafted upon the original stock, nearly entirely driving out the original, which are now commonly classed with Leicesters; what are now termed the "improved Lincolns" universally prevailing; though these vary a good deal in different districts, and now partake largely of the characteristics of both Cotswold and Leicester, though a few of the original breed may be occasionally found, perhaps, on the marshes near the sea.

The improved Lincoln are chiefly valuable on account of their wool, which, by good management, is of a quality equal to that of the lighter long-woolled breeds, and they exceed all others in the weight of their fleece; and no breed now excels them in rapidity of growth and propensity to fatten—points in which formerly they were the most deficient.

Some extraordinary weights of Lincolnshire sheep have been recorded. In 1826, a Mr. Dawson, of Withcall, is reported to have killed three of the following weight and dimensions:—The heaviest, a three shear, weighed 386 lbs., or 96½ lbs. per quarter; measuring from the top of the head to the tail, 4 feet 7 inches; girth behind the shoulders, 6 feet 1 inch; height, 2 feet 8¼ inches. The second, a two shear,

weighed 364 lbs., or 91 lbs. per quarter; and the third, a shearling, 284 lbs., or 71 lbs. per quarter.

The Teeswater.—The Teeswater was originally a tall, clumsy animal, that was a long time coming to maturity, the wool being remarkably coarse, but long, and thinly set. It was remarkable for being very prolific—twins not only being very usual, but cases of four, and even five lambs, having been produced by a ewe at one birth, were not so very uncommon.

The original characteristics of the breed have, however, been considerably modified, by crossing with the Leicesters; from which they have derived quicker feeding properties, and an excellent quality of fleece.

Selection of Breed.—The foregoing brief notice of some of the leading varieties of sheep will probably be deemed sufficient, and serve to show the necessity of choosing a breed that is likely to be the best adapted to the land whereon they are to be placed. A safe rule in this respect is, to choose a breed that is known to thrive where the climate, and pasturage is *inferior*, upon the whole, to that upon which they are about to be placed; and in stocking a farm, it thus becomes necessary to be acquainted with its exact capabilities, not only throughout one year, but through a series of years—about which careful inquiry should be made, if the person interested is not already sufficiently informed upon the subject.

Age and Names of Sheep.—The age of sheep is not counted from the time when they have been dropped as lambs, but from the period of their first shearing, their age being known like that of cattle by the appearance of the fore-teeth of the lower jaw, of

which they also have eight, the upper jaw being without any in front. They are all of small size during the first year; but when from fourteen to sixteen months old, they renew the first two, and two more every year, until the fourth shearing, at which time they are called "full-mouthed." This renewal, however, somewhat depends upon the season of lambing, and also upon the quality of the sheep's keep; those which are the best fed getting their teeth the earliest.

The teeth of sheep begin to fail when they reach their sixth or seventh year, when they are termed "broken-mouthed;" and being thus deprived of the power of easily masticating their food, they fall off in flesh, and are usually (even when kept for breeding) slaughtered before this time, their natural age being about nine or ten years.

The male is called a "ram" or "tup," before he is castrated; after which he is termed a "wedder" or "wether," and the female a "ewe." Both sexes are indifferently styled lambs until they are weaned; but at the future periods of their lives they are severally designated in different districts, as follows:—

From the time of weaning to the first shearing, the males are called "wedder hogs," "hoggetts," "hoggerels," or "tegs;" and the females "ewe hogs" or "gimmers." After the first shearing the males are termed "shearling hogs" or "Dinmonts," and the females "gimmer shearlings" or "theaves." After this time they are known as "two shear," "three shear," or "four shear" wedders or ewes, until they are full-mouthed; when the ewes, if drafted out of the flock, either on account of being barren, or to be

fattened, are termed "cast," or "yelled;" and when turned six years old, are styled "crones."

Breeding.—Ewes are generally fit to breed when they are about fifteen to eighteen months old, a good deal depending upon the time at which they were dropped as lambs. Supposing this to have occurred in January, they would be ready for the ram in the beginning of May in the following year, and the lambs would be dropped about the end of September; but this practice is only followed in the production of house-lamb, and chiefly occurs with Dorset sheep; eighteen months being the more usual period—about September,—and in exposed situations, where it is not desirable that the lambs should be dropped very early in spring, the ewes are not tupped until some time in October.

Number of Ewes to a Ram.—Sixty ewes to a ram is generally the allotted number, when fed upon ordinary farms, upon the usual system followed in sheep-feeding; but upon mountainous districts, where there is a wide, open range, three rams are not unfrequently put to a hundred ewes. A yearling tup will serve as many ewes as an older one, though the opinion commonly prevails that two years is a better age.

Smearing the Breast of the Ram.—So that it may be known which ewes have been tupped, a practice prevails of smearing the breast of the ram with some colouring matter, by which the ewes are marked; and thus, if more than one ram is employed, by using a different colour it can be ascertained which ewes have been served by each. A disappointment, however, sometimes occurs, for the object is not always accomplished, it sometimes happening that the ewes do not

"blossom," or come into season for taking the male; when means should be taken by high feeding to induce them to do so.

A plan has long been in vogue amongst breeders in Leicestershire for preventing the powers of a superior tup from being wasted in this way, as well as ensuring the service of the ewe, by placing him in a small enclosure with only a few ewes, while among the ewe flock an ordinary ram is put as a "teaser," with a piece of packing cloth placed before his genitals, in such a manner as to prevent his serving the ewe. When singled out by the teaser, she is then taken to the ram by the shepherd, and brought away again when served; by which means it is said that high-fed tups will effectually serve as many as four or five score ewes.

When breeding with a definite object in view, in order to remove special defects, either as to shape, size, quality of mutton or wool, a ram must be selected that possesses in an eminent degree the qualities in which the ewes are deficient; and in this case the ewes should be divided, and a tup placed with each parcel, or lot, of the form most suited to the requirements needed.

The period of gestation of the ewe varies from 146 to 160 days, 21 weeks being the time that is usually estimated.

Yeaning.—When put to the ram, the ewes should be in fair, but not high condition; and during the term of their gestation, while not allowed to get weak and poor in flesh, should not be suffered to get fat—a condition which sometimes causes lambing to be fatal. They must, however, be in sufficiently good

condition to give them strength at this trying season, and be able to furnish an abundant supply of milk for the support of their lambs. Feeding, therefore, requires a good deal of judgment, and caution, before this event transpires; and it is considered the safer plan of the two, to give both lamb and ewe better food after it, than feed the ewe too well beforehand.

On moderate-sized farms in an enclosed country, it is found the best plan to put up some moveable, covered pens, which may be easily formed with hurdles, and well litter these pens with straw, fern, or leaves, and allow them to be open to the ewes, so that, having free range of the field, they may retire to the pens when they please. A warm paddock where they would be under the eye of the master is the best place for them; for, although Nature seldom requires to be assisted, yet, at times, the labour is so difficult as to need aid, which an experienced shepherd is able to give. In severe weather, when the yeanning has been long about, the ewe is often so exhausted as to need warm gruel, and comfortable housing away from the rest of the flock, until she has recovered from its effects.

The Lambs.—When they are first born, the lambs not unfrequently appear almost lifeless, and great care is necessary to restore them to animation. They are often brought round, however, when to all appearance dead, by being placed in a warm basket lined with wool, or a soft rug by the kitchen fire, and a little warm milk occasionally being administered. Should the ewe die in labour, or desert her lamb (which seldom happens), the lamb will require to be suckled with cow's milk. Or, it sometimes is the

case, where there are a number of ewes, that one has lost her lamb, and the motherless creature may be put with her; and in this instance the dead lamb's skin is placed round the living one, or the ewe will not take to it perhaps. After a day or two she gets reconciled to the stranger, when the skin can be removed.

When the tup-lambs are eight or ten days old, those not intended to be kept as rams should be castrated. The weather should be dry and mild when this operation is performed, or, if warm, towards evening is considered the best period of the day. At the same time also, they should have their tails docked, or cut off, about three inches from the root; which not only gives a square and handsome appearance to the quarter, but prevents the animal from staining its fleece with its ordure. This practice is universally considered the proper one in the lowlands; but in mountainous and exposed situations it is a questionable one with regard to ewes, as in severe weather the tail is a great protection to the udder.

After this the lambs are turned with the ewes into the ordinary pastures, if they are in a proper condition to receive them. If intended to be sold to the butcher, they are put on the best the farm affords, and, when necessary, fed upon turnips and rape, hay, and bruised oil-cake, so as to produce a good flow of milk. They are then generally ready to be slaughtered at from three to four months old; the gimmers being rather more forward than the wedders, both on account of their earlier disposition to fatten, as well as the tup-lambs being somewhat thrown back through the operation of castrating.

Weaning.—The early part of July is considered

about the best time for weaning, unless the lambing should have occurred late in the spring. Nothing more is needed than to drive the lambs away from the ewes, taking care to separate them so effectually that their mutual bleatings are not heard.

Upon breeding farms, the ewe-lambs should at this time be carefully examined, and if any appear defective, ill-formed, or any way objectionable, they should be sold to the butcher ; or if any have been injured, they should be set apart for cure. They should also be marked, either with ruddle, or tar on the fleece, or by a brand upon the cheek, and notches in the ears. The wedders and ewes should be differently distinguished, by being respectively marked on the off, and the near side. The ewes, after having been separated from their lambs, should be milked three or four times, so as to dry them by degrees with as little inconvenience to themselves as possible, or they will lose their milk by being confined at night in a fold, and allowed during the day to range over a poor pasture.

After the lambs are removed from their dams, their progress should be hurried on, either by putting them upon the best pastures, or upon the aftermath of clover and sainfoin, spring tares, or any other crop that will promote their speedy growth, which should be kept up regardless of expense. When the herbage fails, they should be put during the whole winter upon rape and turnips.

Feeding.—The two most common methods of feeding sheep are either to turn the stock upon the roots, which are thus eaten off the field ; or by carting turnips to a bare pasture, where they are sliced, and given to

them. The first is the least trouble, and it ensures the dung and urine being equally left upon the ground ; but it is a very necessary point, that the land is dry enough for the sheep to be placed on it without injury. The field should be hurdled off in partitions, or the lambs be allowed first to range over the whole till they have consumed the best portions, when the lean stores, and ewes, are put in to follow, so as to eat the whole up clean ; the roots being loosened out of the ground by a man with a grubber. When the land is wet, the turnips must perforce be carted off, this method being universally followed when mangold wurtzel is used ; and it is a convenient mode of consumption for the sheep themselves, and a highly beneficial one to pastures.

In feeding with turnips, some dry provender, such as oat-straw, pea-haulm, or hay, is an excellent addition for preventing any attack of looseness ; as it occasions the food to remain longer in the stomach, and is probably also the means of enabling it to extract a greater amount of nourishment from the roots than could be obtained were they eaten alone. As hay is expensive, pea-haulm, of which the sheep are very fond, is a capital substitute.

Hay is a very expensive item, and Mr. Randell, whom I have before quoted, suggests that by rigid economy in its use, some might even be sold to cover in part the cost of purchased food. I will, however, here insert the remainder of his letter on the subject which refers to feeding sheep.

Mr. Randell says :—

“ It will frequently happen that by rigid economy in the use of hay—the most expensive food, looking

at its selling value, that a farmer can give to his cattle—he may be able to sell some to cover in part the cost of purchased food. But if clay-land will not grow turnips, it will grow mangolds, cabbages, tares, and clover ; and these crops, eaten by sheep, will give a more satisfactory return than can be obtained by cattle. In my case the clover, with at first pulped mangolds, chaff, and cake, or corn, and tares, carry the 300 breeding ewes with their lambs until the latter are fit to wean, and the early cabbages are ready for them ; and these, succeeded by later kinds, all fed off where grown, last till October, when the sheep should be off the land and wheat sown. They then go into yards having sheds, the floors of which are covered with burnt soil as often as necessary. This accumulates until, in the spring, it is often three feet deep—a valuable manure. Their food there is pulped mangolds, wheat-chaff, and malt-dust, one mixture : clover, chaff, Indian corn, and cotton-cake—another. It is not often that this burnt soil can be had for the spaces outside the sheds—straw does very well ; but if neither can be spared, we use tan. When straw is sufficiently abundant sheep will do without any other litter, and make very good manure ; but only enough to keep them clean should be used daily, so that the whole may be compressed by treading, and fermentation prevented. The feet of the sheep should be pared every six weeks—if these two precautions are observed they will not be lame. The ewes are wintered by hurdling off the grass-land that had been mown, or grazed by dairy cows, and have an abundance of cut chaff, Indian corn, and decorticated cotton-cake.”

In supplying Mr. Randell's testimony, Mr. Darby also points out, in reference to the increased use of straw, that the former gentleman pronounces the opinion very decidedly that, by the employment of more straw in conjunction with artificial food for feeding purposes, which the provision of covered yards would save from littering purposes, double the number of cattle might be kept, which the subjoined remarks illustrate :—

“With the aid of purchased food, combined with straw, the stock of cattle might be doubled, provided that litter were economised by covered yards ;—this does not apply to sheep. With the increased stock so kept, as much hay as is now grown would still be required, or might be sold to pay for food purchased. Hay is the dearest of all food. No doubt littering cattle in boxes with cut straw is right ; it is only a question between boxes and covered yards. I do not believe in sparred floors, or pavements. Sawdust or tan may supplement straw—not be entirely a substitute for it.”

Diseases of Sheep.—Sheep are subject to a long train of diseases which bear the same names as most of those which affect cattle, and arise from the same causes, but there are a few to which sheep are more particularly liable, which I will briefly enumerate, many of which may be prevented by good management and careful treatment.

Distension of the rumen is more rare with the sheep than the ox, but hoove is equally frequent, and often occasioned by turning a flock into a field of clover, or other succulent food. When sheep are first turned on succulent food, it is a good plan to drive them

about for some time, to prevent them eating too rapidly, while the exercise favours the escape of gas. When cases of hoove, hoven, or blasting, as it is indifferently termed, occur, the probang must be used promptly as with cattle.

Diarrhœa in Lambs and Sheep.—The change of diet after weaning sometimes brings on diarrhœa in lambs, and if the looseness is only moderate it may pass off without injury; but if continuous, recourse may be had to treatment. A cordial medicine, composed of the following, will be found useful:—

Catechu, powdered	. . . .	4 drachms.
Prepared chalk, powdered	. . . .	1 oz.
Ginger, powdered	. . . .	2 drachms.
Opium, powdered	. . . .	$\frac{1}{2}$ drachm.

mixed with half-a-pint of peppermint-water, and two or three tablespoonfuls given twice a day for a sheep, and half that quantity for a lamb.

In the case of a lamb, it is sometimes advisable to administer a couple of drachms of Epsom salts, to clear out the intestines, previous to giving the cordial medicine.

The "white skit" in lambs—so called from the colour of the fæces—is a more dangerous disease, and does not arise from looseness, but the opposite—constipation, and is owing to coagulation of the milk in the fourth stomach, where it sometimes accumulates to the weight of several pounds, the whey passing off by the bowels, which gives this deceptive appearance to the dung.

Alkalies should be given to dissolve the hardened mass. Half an ounce of magnesia dissolved in water; or a quarter of an ounce of hartshorn mixed in water,

or both combined in smaller quantities, should be given and repeated; followed by Epsom salts, and afterwards by a little of the cordial medicine.

Dysentery or Braxy.—This is more serious than diarrhœa, being inflammation of the coats of the stomach, but very often produced by diarrhœa, and attended by fever, chiefly brought on from sudden change of pasture, as from a succulent to a high and dry one; or exposure to wet and cold after travelling. Sudden change of food ought always therefore to be avoided.

Linseed gruel should be given, and the following medicine :—

Linseed oil	2 oz.
Powdered opium	2 grains.

Bleeding is sometimes found necessary.

Catarrh.—Sheep are very subject to catarrh in wet seasons, or when exposed to changes of weather. Good shelter, and good nursing are required. Here, again, care and attention will guard against this often-recurring ill; much attention to food and shelter guarding against a variety of disorders. Great care, especially in respect of feeding, should be practised on lambs, which should never be allowed to touch turnips, or clover, when the frost is on them.

Foot-rot.—The foot of a sheep is naturally suited to a dry soil, but when it is immersed in wet for many days together, the horn becomes soft and elongated, is easily penetrated by gravel or stones, and, in time, the upper part, where it is thinnest, becomes detached from its connections. Inflammation, succeeded by chilliness, brought on in the extremities, is produced

by the evaporation which proceeds from the wet surfaces, so that soreness, inflammation, and the consequent suppuration, and, at times, ulceration, follow, not unfrequently penetrating under the horn, which causes the hoof to be entirely lost.

Animals so affected must have their feet protected from moisture, the rugged parts of the foot being pared away, and a stimulant, or caustic, applied to the denuded part, to promote healthy action. A useful recipe for this purpose consists of

Tar	.	.	.	.	.	.	.	8 oz.
Lard	.	.	.	.	.	.	.	4 "

first melted together, and afterwards having added to them

Oil of turpentine	.	.	.	.	.	$\frac{1}{2}$ oz.
Sulphuric acid (by measure)	.	.	.	.	.	$\frac{1}{2}$ "

Muriate of antimony is a good application when a caustic is required, which should be applied with a feather, and the foot afterwards receive an application of tar mixed with grease.

Concretions of the Stomach.—Earth is at times taken up into the stomach with the food that is eaten, and in the ordinary way it does not appear to be injurious, it having been surmised that, so appropriated, it may, indeed, be of service in moderate quantities in neutralizing the acids in the rumen. Sometimes, however, when too great a quantity has been swallowed, inflammation of the coats of the stomach and intestines is produced, which sometimes ends fatally.

In the stomachs of lambs, a number of small balls are sometimes found, in the autumn months, which have acquired the same shape as that of the stomach,

which appear to consist of fibres of wool and hard food, matted together with mucus.

Saline purgatives should be administered in these cases, such as sulphate of magnesia, together with vegetable tonics.

Sheep are also subject to redwater, which, however, is not the same disease as with cattle; apoplexy; tetanus, or lock-jaw; palsy, or a suspension of the powers of the nervous system; rabies, or canine madness; obstructions in the gullet—though far less frequent with the sheep, than with the ox; pneumonia, or inflammation of the lungs; and pleurisy, or inflammation of the membrane which lines the chest; the rot, or *cothe*; consumption; small-pox, &c.; all of which demand treatment when they occur; and, finally, from the tick and flesh-flies.

The tick is an insect that propagates rapidly, and would prove very irritating and injurious to sheep were it not for the custom that now universally prevails of dipping both sheep and lambs every year—the ewes just after they are shorn, and the lambs at the same time—in order to prevent them from communicating the insect again to the ewe.

The dipping compound is generally sold by veterinary surgeons, or druggists, a poisonous compound being used which demands a certain amount of caution in its application, and care must be taken that the head is not immersed.

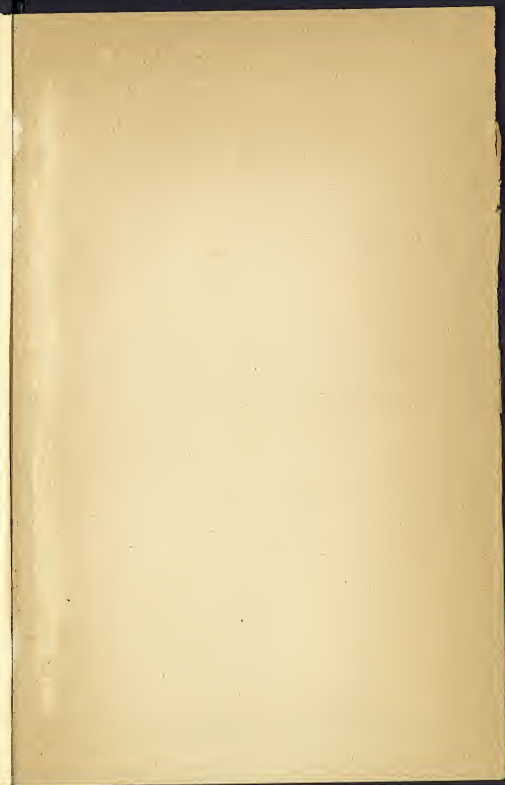
The bot is a dreadful scourge in a flock, large maggots taking up their abode in the frontal sinus for many months, causing vertigo, staggers, suffocation, and finally death. The fluke (*Fasciola hepatica*)

causes the rot, and a tapeworm sometimes takes up its abode in the intestines.

Mercurial ointment and tobacco-water will eradicate the ticks ; and when oil of turpentine can be safely used it will always be found to destroy insect enemies. The bot is arrested by removing the flock to a dry soil, and it is said that sheep are cured of it by eating the bark and young shoots of the elder. As however I have before remarked, in the great majority of cases disease may be prevented, or avoided, by the exercise of proper care in feeding, housing, and general management, without which it is scarcely reasonable to expect animals to be healthy and thrive, living, as they do, for the most part in an artificial condition.

THE END.



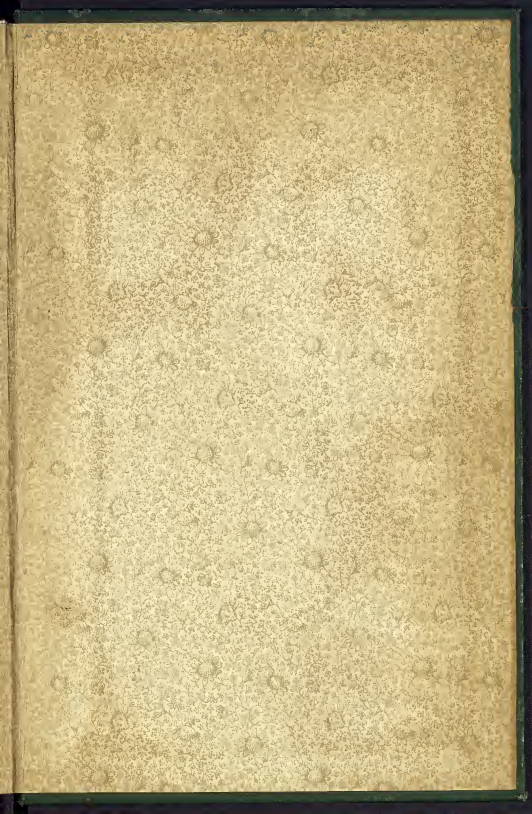


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